AIR SUPERIORITY BY THE NUMBERS: CUTTING COMBAT AIR FORCES IN A TIME OF UNCERTAINTY

BY

MAJOR TAYLOR T. FERRELL

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14. ABSTRACT

The central goal of this thesis is to identify and articulate the risks associated with a small combat air force (CAF). The author compares and contrasts the fighter force of today with that of the force employed during the Gulf War of 1991. Dramatic differences in the size, composition and readiness of today???s air superiority fighter force illuminate significant strategic vulnerabilities associated with fighting major theater war. Using the variables of total fighter force size, air superiority force availability, fighter pilot availability and realistic combat training levels, the author provides a realistic assessment of the following question. If the CAF were called to fight a force similar in capabilities to the Iraq Air Defense System of 1991, could we do it and at what cost? Comparing the size of the total fighter force against the Persian Gulf wartime requirement, today???s CAF would suffer from a lack of strategic depth and forward presence. Fighter pilot manning and low readiness levels exacerbate the problems of a small CAF, leading the author to conclude that while the CAF could fight a major theater war, the strategic costs associated with committing such a large proportion of the force would preclude the US from maintaining its global security commitments. These costs may dissuade policy makers from using the CAF for its intended purpose ??? projecting combat airpower for national security.

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The conclusions and opinions expressed in this document are those of the author. They do not reflect the official position of the US Government, Department of Defense, the United States Air Force, or Air University.

ABOUT THE AUTHOR

Major Taylor T. Ferrell earned his commission in 2000 through the Air Force Reserve Officer Training Program at the University of Kentucky. He is a weapons school graduate with more than 1,600 hours in the F-15C. His flying assignments include Eglin AFB, Florida, Tyndall AFB, Florida and Nellis AFB, Nevada. While stationed at Nellis AFB, Major Ferrell served as a United States Air Force Weapons School Instructor and the Aide de Camp to the United States Air Warfare Center commander. He holds a Bachelor of Science Degree in Economics from Centre College, a Master of Aeronautical Science and Technology from Embry-Riddle Aeronautical University, a Master of Military Operational Art and Science from Air Command and Staff College, and a Master of Philosophy in Military Strategy from the School of Advanced Air and Space Studies, Air University, Maxwell AFB, Alabama. Upon graduation from SAASS, Major Ferrell will become the Red Flag Deputy Commander in the 414th CTS at Nellis AFB, Nevada.

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ABSTRACT

The central goal of this thesis is to identify and articulate the risks associated with a small combat air force (CAF). The author compares and contrasts the fighter force of today with that of the force employed during the Gulf War of 1991. Dramatic differences in the size, composition and readiness of today's air superiority fighter force illuminate significant strategic vulnerabilities associated with fighting major theater war. Using the variables of total fighter force size, air superiority force availability, fighter pilot availability and realistic combat training levels, the author provides a realistic assessment of the following question. If the CAF were called to fight a force similar in capabilities to the Iraq Air Defense System of 1991, could we do it and at what cost? Comparing the size of the total fighter force against the Persian Gulf wartime requirement, today's CAF would suffer from a lack of strategic depth and forward presence. Fighter pilot manning and low readiness levels exacerbate the problems of a small CAF, leading the author to conclude that while the CAF could fight a major theater war, the strategic costs associated with committing such a large proportion of the force would preclude the US from maintaining its global security commitments. These costs may dissuade policy makers from using the CAF for its intended purpose – projecting combat airpower for national security.

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Chapter 1 - Introduction

A Dangerous Moment

> *Since the German attack on Poland in 1939, no country has ever won a war in the face of enemy air superiority, no major offensive has succeeded against an opponent who controlled the air, and no defense has sustained itself against an enemy who had air superiority. Conversely, no state has lost a war while it maintained air superiority, and attainment of air superiority consistently has been a prelude to military victory.*
>
> Colonel John A. Warden III
> *The Air Campaign: Planning for Combat*

In 2007, Secretary of the Air Force Michael Wynne warned Congress that the Air Force is going out of business. "At some time in the future, aircraft will simply rust out, age out, or fall out of the sky."[1] Today, as Wynne foretold, the USAF is facing a crisis. The Combat Air Force (CAF) is ailing from aging weapons platforms, reduced flying hours, fighter pilot retention, delayed or cancelled production of fifth-generation fighters, and uncertainty about the future role that combat airpower will play in defense of the nation.[2] Although the USAF has encountered these problems before, the present situation is different. Aggravated by dwindling defense budgets, congressional sequestration laws and recurring government shutdowns, the US can no longer afford to buy or train the CAF the nation requires. With the smallest and oldest fighter fleet since the Air Force's inception in 1947, maintaining the world's most formidable combat air weapon in the absence of sufficient financial backing poses one of the most significant challenges in modern military

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[1] Richard B. Andres, "Up in the Air," *The American Interest*, September 2010, 1.

[2] Rebecca Grant, "Combat Air Forces in Crisis," *Mitchell Institute for Airpower Studies*, Mitchell Paper 1, March 2009. 4

history.[3] While the USAF balances risk in pursuit of modernization, continued force structure cuts threaten to undermine America's airpower advantage. While cutting the size of the force may be required to ensure long-term viability, driving force numbers to historical lows comes at a dangerous time and may prove very costly.

The world is not static. The geopolitical environment is changing and US hegemony is in decline.[4] At the end of the Cold War, the US emerged as the world's preeminent superpower. For more than two decades, the US has dominated a uni-polar international political structure. During this period, its relative economic and military strength has gone unmatched. This uneven distribution of power allowed the US to establish and maintain international order. In doing so, it has instituted the rules of the game and socialized other states to those rules. Accordingly, socialization of states has encouraged similarities and predictability in behavior.[5] Underneath this political order, no nation state has been strong enough to dissuade the US from leveraging military force -evident of its unhindered pursuit of national security objectives.

Recent military operations in the Balkans, Iraq and Afghanistan were not interfered with by outside nation-states. US ambitions to rid Kuwait of Iraqi aggression in 1991 were possible in part because the international structure allowed it. Few other nations had the military might to oppose US interests. Had Gulf War I occurred under the umbrella of the Cold War, Soviet strength might have interfered with the US liberation of Kuwait. Likewise, Soviet resistance may have prevented US military intervention in the Balkans during the rash of ethno-national violence. But with great power comes great responsibility and exercising

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[3] General Norty Schwartz, "Sustaining Readiness with Constrained Budgets" (Air Force Association Air Warfare Symposium, February 23, 2012). 2

[4] Israel Shamir, "The Cape of Good Hope: Russia, Syria and the Decline of American Hegemony," *Paul Craig Roberts Institute of Political Economy*, October 8, 2013. 4

[5] Kenneth N Waltz, *Theory of International Politics* (Long Grove, Ill.: Waveland Press, 2010). 76.

the military instrument of power for sustained periods of time carries significant cost.[6]

Increasing budget deficits and decreasing military spending are primary indicators of US decline. As of January 2014, the US budget deficit is surpassing $17.3 trillion.[7] The wars in Iraq and Afghanistan are estimated to cost American taxpayers $4 to $6 trillion.[8] The US is approaching the point where the costs of maintaining world order exceed its ability to pay. Despite modestly increasing budgets over the next decade, deficit reductions will reduce future DOD expenditures by $487 billion.[9] Accordingly, fighter force attrition has followed spending trends. Since Gulf War I, the total fighter force - the Active Duty (AD) and Air Reserve Component (ARC) - has decreased in strength from approximately 36 fighter wing equivalents, to a 2010 Quadrennial Defense Review (QDR) requirement of 16-17 wings.[10] The only new fighter in production is the F-35, and Lockheed Martin is struggling to meet preplanned production levels as cost estimates for operating and supporting the fleet now exceed $1 trillion.[11]

While reductions in military spending limit the strategic breadth of US power, policy makers should remain no less mindful of the need to preserve current conventional combat capabilities against the possibility of future showdowns against more formidable opponents who will

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[6] Waltz, *Theory of International Politics,* 113.

[7] "US Debt Clock.org," accessed January 22, 2014, http://www.usdebtclock.org/.

[8] Ernesto Londono, "Iraq, Afghan Wars Will Cost $4-$6 Trillion," *The Washington Post*, accessed January 22, 2014.

[9] "Defense Budget Priorities and Choices" (US Department of Defense, January 2014). 1

[10] Lt Col Christopher J. Niemi, USAF, "The F-22 Acquisition Program. Consequences for the US Air Force's Fighter Fleet," *Air & Space Power Journal* no. November-December 2012, 53.

[11] Michael J. Sullivan, *F-35 Joint Strike Fighter: Slower Than Expected Progress in Software Testing May Limit Initial Warfighting Capabilities* (United States Government Accountability Office, March 26, 2014), http://gao.gov/assets/670/661957.pdf.

threaten us for higher stakes in years to come.[12] American reluctance to intervene militarily in the Syrian conflict or the Russian annexation of Crimea is evidence of the redistribution of power. Although the US has implemented economic sanctions against Russia, opposition to US interests remain unchecked by the Obama Administration, while President Putin publicly denounces the notion of "American exceptionalism."[13] The future is becoming more uncertain as the international political structure evolves in to a multi-polar structure that invites competition from rising powers.

The 2011 National Military Strategy outlines the intensifying competition within the international community. The strategic environment demonstrates a changing distribution of power, indicating evolution toward a "multi-nodal" world characterized more by shifting, interest-driven coalitions based on diplomatic, military and economic power.[14] The developing economies of China, Russia, India and Brazil continue to expand, intensifying the competition over dominion of the global commons. These countries, and possibly others yet to emerge, could include advanced threats such as improved integrated air defense systems (IADS) and fighter aircraft denying access to heavily defended areas that hinder our operations across the battle space.[15] Additionally, the Arab Awakening highlights the instability of much of the developing world and uncertainty for the future of states under pressure to perform.[16]

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[12] Lambeth, Benjamin S., "Lessons from Modern Warfare: What the Conflicts of the Post-Cold War Years Should Have Taught Us," *Strategic Studies Quarterly* 7, No.3 (Fall 2013).

[13] Shamir, "The Cape of Good Hope: Russia, Syria and the Decline of American Hegemony." 5

[14] "The National Military Strategy of the United States" (Department of Defense, 2011).

[15] Lambeth, Benjamin S., *Lessons from Modern Warfare,* 67.

[16] Department of Defense, *Sustaining U.S. Global Leadership, 2.*

According to Robert Gilpin, enduring the global power transition is the most difficult problem a declining great power may face.[17] While current US defense strategy positively reflects a redistribution of power, the strategic rebalance to the Asia-Pacific region will demand greater conventional airpower capabilities than recent conflicts have required. Furthermore, US hegemony in the current and near term international political structure lacks the ability to choose its wars or the preferred war of fighting. Benjamin Lambeth contends that, "if the United States intends seriously to preserve its current privileged status as the world's sole surviving military heavyweight, it will have no choice but to keep its forces capable of effective and credible employment across the entire conflict spectrum" without exhausting all resources in the process.[18] Global hegemony is As Pentagon planners develop strategic guidance hedging against tomorrow's most likely wars, they should not forget to hedge also against the one we cannot afford to lose.[19]

As the US withdraws from Afghanistan, more than a decade of sustained military operations has exhausted the CAF. Dwindling budgets in conjunction with a land-intensive counter terrorism (CT) and counter insurgency (COIN) campaign precluded the USAF from recapitalizing its aging fighter force. The USAF consumed all resources funding operations and maintenance in support of ground forces that resulted in procurement cancellations and delays of next generation F-22 and F-35 fighters. Moreover, the procurement process for fifth-generation fighters has taken nearly four decades to play out.[20] Cost overruns and production delays meant the remaining fighter fleet exceeded planned flying hour schedules that significantly impact service life. Today, the fighter fleet is on average 22 years old and limited

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[17] Robert Gilpin, *War and Change in World Politics* (Cambridge, UK: Cambridge University Press, 1981). 18

[18] Lambeth, Benjamin S., *Lessons from Modern Warfare,* 69.

[19] Lambeth, Benjamin S., *Lessons from Modern Warfare,* 73..

[20] Andres, *Up in the Air,* 6.

budgets cannot provide service life extensions and capability upgrades necessary to manage risk.[21] As the US seeks to retain the capability and credibility of the CAF, it should come as no surprise that the USAF needs a right-sized and ready fighter force.

Defense means something different for the United States than it does for other nations. As the world's most powerful country, the US military's responsibility extends beyond territorial defense and protection.[22] Its primary purpose is to defend the global commons and the international order by ensuring peace among the major powers.[23] In a strategic environment with a growing number of state and non-state actors that can influence regional security, a waning US military force elevates the risk of instability and conflict. "When the Roman legions could no longer support Rome's military obligations," outside aggression led to the overthrow of the empire.[24] When the British Navy could no longer balance the ambitions of Europe's major powers at the turn of the century, neither economic interdependence nor the League of Nations could prevent the two world wars that followed."[25] Cutting the CAF indicates a redistribution of US military power. As the international structure changes, so will international order. Unable to support its international commitments, the post-Cold War long peace among the major powers cannot last forever.

The primary criticism against those who oppose CAF reductions is that in the post-Cold War environment, the absence of a formidable threat does not justify the cost. The collapse of the Soviet Union

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[21] Lieutenant General Burton M. Field, "Presentation to the House Armed Services Committee Subcommittee on Tactical Air and Land Forces, U.S. House of Representatives," April 17, 2013.

[22] Leon Panetta, "Sustaining U.S. Global Leadership," introductory letter by Secretary of Defense, (n.d.). 8

[23] Andres, *Up in the Air, 5.*

[24] Andres, *Up in the Air,* 7.

[25] Andres, *Up in the Air,* 7.

removed the main threat that the USAF was organized, trained and equipped to fight. Today, there simply is not a requirement for such an advanced fighter force. While no Air Force in the world matches US capabilities, the technological advancements and proliferation of enemy Integrated Air Defense Systems (IADS) significantly lowers the likelihood of gaining and maintaining air superiority under current force structures. Moreover, the growing level of uncertainty means the US lacks the luxury of predicting who the next threat will be and under what circumstances war will ensue. Our nation requires a flexible fighter force ready to conduct full spectrum military operations. While we may never fight Russia or China, we can be certain that we will fight their equipment.[26]

Research Question

The argument advanced here is that the air superiority fighter force is not resourced to fulfill its purpose – successfully conduct and sustain full spectrum of operations while retaining sufficient strategic depth to meet national policy objectives. The US requires a much larger, ready fighter force to dissuade and, if required, decisively win a major combat operation against a near-peer threat while covering its bets across the globe. While the Obama administration's new defense policy calls for smaller, more agile forces, advanced systems, power projection into anti-access environments, and refocus on the Asia Pacific and the Middle East, the CAF does not have sufficient numbers of fighters or pilots to meet the intent of the national military strategy.[27] Yet the USAF continues to disrupt the balance between quality and quantity by pursuing a modernized, technologically advanced force in lieu of numerical strength – a symptom typical of a hollow force.

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[26] Adam R.M. Smith, "Shaping an Air Force: From a Chief's Perspective" (Air University, 2011). 56

[27] Leon Panetta, "Sustaining U.S. Global Leadership."

The central theme of this thesis revolves around this idea: The Gulf War of 1991 serves as the high water mark for airpower. In 42 days, US air forces halted Iraqi aggression and paralyzed Iraqi air and ground forces in the liberation of Kuwait. Together with allied airpower, the coalition systematically dismantled one of the most formidable air defense system outside of Moscow. If the CAF was called to fight a force similar in capabilities to the Iraq Air Defense System of 1991, could we do it and at what cost? If so, what percentage of total fighter force resources, including aircraft and pilots, would the CAF need to commit to war and how do current readiness levels impact the quality of that force? More importantly, what strategic risks does the US face from employing a small fighter force in a major theater war?

Gulf War I represented the first major conventional war in more than 40 years.[28] The F-15C Air Superiority fighter achieved an extraordinary 31-to-0 kill ratio in air-to-air combat, involving only 23 percent of the total fighter force.[29] Overall losses were estimated at 20 percent on the first night of combat, however the Iraqi IADS only downed 13 US Air Force aircraft during the six-week air campaign.[30] While the force had been equipped and trained to fight a much larger Soviet force, it was evident that the air-to-air fighter fleet was capable of meeting air superiority needs against a significant threat while maintaining security and stability in regions of strategic priority around the world.

The 2011 National Military Strategy of the United States maintains that readiness is a top priority of national defense. For the context of this paper, readiness is defined as "the ability to provide and integrate capabilities required by Combatant Commanders to execute their assigned missions."[31] While the likelihood of fighting a major theatre air

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[28] Niemi, *The F-22 Acquisition Program,* 57.
[29] Niemi, *The F-22 Acquisition Program,* 57.
[30] Niemi, *The F-22 Acquisition Program,* 62.
[31] "The National Military Strategy of the United States." 2011

campaign like Operation Desert Storm is low, the significance of fighting one under the current and future geopolitical environment could be devastating. If rising powers test US resolve, America may be faced with the prospect of either reneging on its commitments or fighting ruinous wars.[32] While the wars in Iraq and Afghanistan have cost more than 6,500 US lives, a war requiring an IADS takedown in a contested and degraded operational environment could well cost that many lives in the first few days of combat.[33]

The Way Ahead

Chapter 2 begins with an analysis of the current state of affairs in the Combat Air Force. It examines the time period following the Gulf War that sized and shaped the fighter force today. Focusing on the air superiority fighter force, this chapter analyzes the total force structure, aircraft and pilot availability, and realistic combat training levels as it relates to operational readiness – the ability to meet COCOM intent. Information is provided by interviews from group and squadron leadership within the F-22 and F-15C community. Ultimately, the size of the CAF is impacting the ability to maintain desired readiness postures.

Chapter 3 is a comparative analysis of the CAF of yesteryear, or the Gulf War force, to the force of today. It examines the pre-Gulf War strategic landscape that shaped and sized the force of 1991. It highlights a dramatic difference in the number of resources available, including fighters and aircrew, and the high level of readiness achieved during the years leading up to Operation Desert Shield. The emphasis on developing a robust fighter force in preparation for war resulted in one of the most lop-sided air battles in modern history. This chapter highlights the dramatic reductions in CAF resources over the past two decades.

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[32] Andres, *Up in the Air,* 8.
[33] Andres, *Up in the Air,* 9.

Chapter 4 evaluates the strategic impact of CAF reductions on US ability to conduct major combat operations. Focusing on US strategic intent, it provides a realistic assessment of what the force is capable of accomplishing, at what risk and cost, and how political decision-makers may be impacted as a result. It concludes that while the US seeks to avoid protracted ground wars, it does not possess a CAF large enough to fulfill the national strategic objectives under current assumptions of risk.

This thesis concludes by highlighting the risks and costs associated with the small CAF. While the USAF seeks to maintain a technologically superior fighter force, numbers still matter. In determining how deep to cut the force, decision-makers must understand the impact that size has on readiness and its ability to sustain capability and credibility. If future cuts continue, the size of the force may be insufficient to support national strategic objectives.

It is necessary to sacrifice some analytical depth in order to acquire the breadth of this problem. The CAF refers to all fighter, attack, bomber and some intelligence-surveillance-reconnaissance (ISR) assets, however this paper will focus on a subset of the core of the USAF's manned fighter force – the air superiority fighter force. Although air superiority includes a multitude of platforms and capabilities, the focus on the air superiority mission is twofold. First, air superiority is the primary USAF mission and traditionally requires a larger percentage of the force to succeed. Second, while US air superiority has been uncontested over the past two decades of conflict, the US defense establishment has become too comfortable operating in permissive air environments and has deemphasized "command of the air" in the face of emerging threat systems. Although CAF reductions impact all fighter mission areas, the single role, air superiority fighter force today represents the biggest resource-to-strategy mismatch in the USAF.

Chapter 2

The State of Affairs Today

Air superiority is the core USAF mission.[1] While there is no official joint definition, air superiority can be characterized "as that state in which an airpower force is assured of being effective in all its offensive tasks or missions – in the air, ground and space."[2] Entrusted to the CAF, gaining and maintaining air superiority is a precondition to any operational military campaign. General John Corley, former commander of Air Combat Command, stated that "everybody has figured out that airpower – specifically, from the US Air Force – is America's asymmetric advantage. They want to take that away from us."[3] Historically, the Air Force has served as the nation's quick reaction force, able to deploy anywhere on the earth within 24 hours.[4] As we face emerging security challenges within a resource-constrained environment, it is important to analyze fighter force structures and readiness levels to evaluate whether the CAF can meet mission requirements at an acceptable level of risk.

The purpose of this chapter is to identify current air superiority fighter resources as they relate to operational readiness. It will begin by analyzing the post-Gulf War strategic landscape and national defense strategies that have impacted the size, composition, and sortie production capacity of the air superiority fighter fleet today. Next, it will address deployment demands on the fighter force as it relates to aircraft and pilot availability to meet operational requirements. Finally, it will discuss quality of training as a result of force reductions and sequestration that significantly impact the USAF's ability to fund high-fidelity training exercises designed to optimize aircrew readiness.

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[1] Grant, Rebecca, *Losing Air Dominance*, A Mitchell Institute Special Report (Mitchell Institute Press, September 2008). 6

[2] Grant, *Losing Air Dominance*. 4

[3] Grant, *Losing Air Dominance*. 4

[4] Charles W. Lyon, *Interview,* January 29, 2013.

A Smaller, Stealthier Force

According to 2012 USAF strategic guidance, US forces will no longer be sized to conduct large-scale, prolonged operations.[5] The CAF will be smaller, but remain highly capable, lethal, ready, agile and deployable.[6] With 1,100 primary mission aircraft, the fighter force structure is the smallest in history, yet the demand for airpower in support of the national security strategy continues to grow. The CAF must be "capable of deterring aggression and providing a stabilizing presence, especially in the highest priority areas and missions in the Asia-Pacific region and the Middle East, while still ensuring our ability to maintain our defense commitments to Europe and other allies and partners."[7] As USAF continues to balance risk to the fighter force structure and meet strategic demands, it is important to understand the historical context that shaped and sized the force we have today.

In the midst of the Cold War, US strategic goals required a technologically advanced conventional fighter force. In the early 1980's, the USAF began development of an Advanced Tactical Fighter (ATF) to replace all Air Superiority F-15s. DOD officials felt the Soviet Union and Soviet bloc countries had a significant quantitative advantage over the United States and its allies in fighter aircraft and the USAF believed a technological or qualitative advantage was critical.[8] Furthermore, the USAF's need for the ATF was based on an evolving and increasingly more capable Soviet threat F-15s would not be able to overcome, even with planned upgrades.[9] Designated the F-22, the new fighter would redefine

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[5] "USAF Force Structure Changes: Sustaining Readiness and Modernizing the Total Force" (Department of the Air Force, February 2012). 1

[6] USAF Force Structure Changes, 1.

[7] USAF Force Structure Changes, 2.

[8] *The Advanced Tactical Fighter's Costs, Schedule, and Performance Goals* (Washington D.C.: General Accounting Office, January 1988), http:/www.goa.gov/assets/150/146085.pdf. accessed 2 February 2014.

[9] GOA, *The Advanced Tactical Fighter's Costs, SChedule and Performance Goals*. 4.

the technological limits of combat aviation. A combination of stealth, high-maneuverability, and super-cruise capability, the F-22 was intended to cement the future of American air superiority for years to come.[10] Furthermore, the advancement in capability meant the USAF would require fewer fighters. By early 1990, the USAF announced the ATF would replace all F-15s at a ratio of 1:2, meaning the size of the force would be cut in half.[11] As defense contractors began the development and design for the F-22, the events of the Gulf War would reinforce the desire for a technologically advanced fighter force.

The opening night of ODS leveraged USAF F-117 stealth and precision against Iraqi command and control (C^2) infrastructure within Baghdad. While more than 60 SAM sites and 3000 antiaircraft guns encircled the capital, not a single stealth fighter was lost to surface threats.[12] The F-117 flew 1,271 combat sorties in the 42-day campaign without a single loss and sealed the USAF's plan to pursue an "all stealth" force. [13] Shortly after the Gulf War, Chief of Staff of the Air Force, General Merrill McPeak, testified that there was no point in buying any more "aluminum" fighters and that the future CAF would be comprised of nothing but stealth.[14] By the spring of 1991, the USAF's plan to cut the fighter force structure in lieu of a smaller more technologically advanced force was taking shape. However, the fall of the Soviet Union in 1991 left the US without a credible threat in the near term, and the development of the F-22 program would struggle to maintain relevance within the defense establishment.

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[10] Grant, *Losing Air Dominance*. 7.
[11] Grant, *Losing Air Dominance,* 8.
[12] United States Central Command, *Desert Shield Desert Storm, The 10th Anniversary of the Gulf War* (Faircount, LLC, 2001)., 69
[13] United States Central Command, 69
[14] Grant, *Losing Air Dominance*. 8.

A sustained decline of the fighter inventory coincided with the development and acquisition of the F-22.[15] In April of 1991, Secretary of the Air Force, Donald B. Rice, announced that 750 F-22s would be required to meet national security needs, however no plans were in place for delivery of the first operational units until 2005.[16] With an estimated program cost of $99.1 billion in "then-year dollars", engineering and development drove average production unit cost (APUC) to $122.8 million - more than four times the $30 million unit cost for the F-15Cs it would replace.[17] Unfortunately, post-Gulf War defense spending cuts and evolving security priorities plagued the F-22 program, decreasing procurement numbers needed to meet operational requirements.

Drawing down defense spending is typical during post-war periods. During the Clinton administration, DoD deliberately delayed force modernization to reap a "peace dividend" after the Cold War.[18] Resulting in the lowest defense spending levels in the previous four decades, the Clinton cuts inspired future defense guidance. The 1997 Quadrennial Defense Review (QDR) justified reducing F-22 program quantities from 448 to 339 due to its "much greater capability over that of the F-15".[19] During the George W. Bush administration amidst the early stages of Operation Enduring Freedom (OEF), Secretary of Defense Donald Rumsfeld chose to "skip a generation" of aircraft technology in favor of a smaller, leaner force.[20] In 2004, with rising military costs looming in Iraq and Afghanistan, Rumsfeld approved Program Budget Decision 753 that directed a historic cut in fighter spending by removing $10 billion

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[15] Lt Col Christopher J. Niemi, USAF, "The F-22 Acquisition Program. Consequences for the US Air Force's Fighter Fleet," . 54.
[16] Grant, *Losing Air Dominance*. 7
[17] Lt Col Christopher J. Niemi, 15
[18] Grant, *Combat Air Forces in Crisis,* 4.
[19] Department of Defense, *The Quadrennial Defense Review,* 1997.
[20] Grant, *Combat Air Forces in Crisis,* 5.

annually from F-22 procurement.[21] As late as 2008, Air Force Chief of Staff, T. Michael Moseley, stated the USAF needed a minimum of 381 F-22s to meet the demands of the Air Expeditionary Force (AEF) construct. However, Defense Secretary Robert Gates announced that F-22 production would end at 187, approximately 25 percent of the original planned.[22] Figure 1 illustrates the 31 percent decline in defense spending that led in part to curtailed F-22 acquisition.

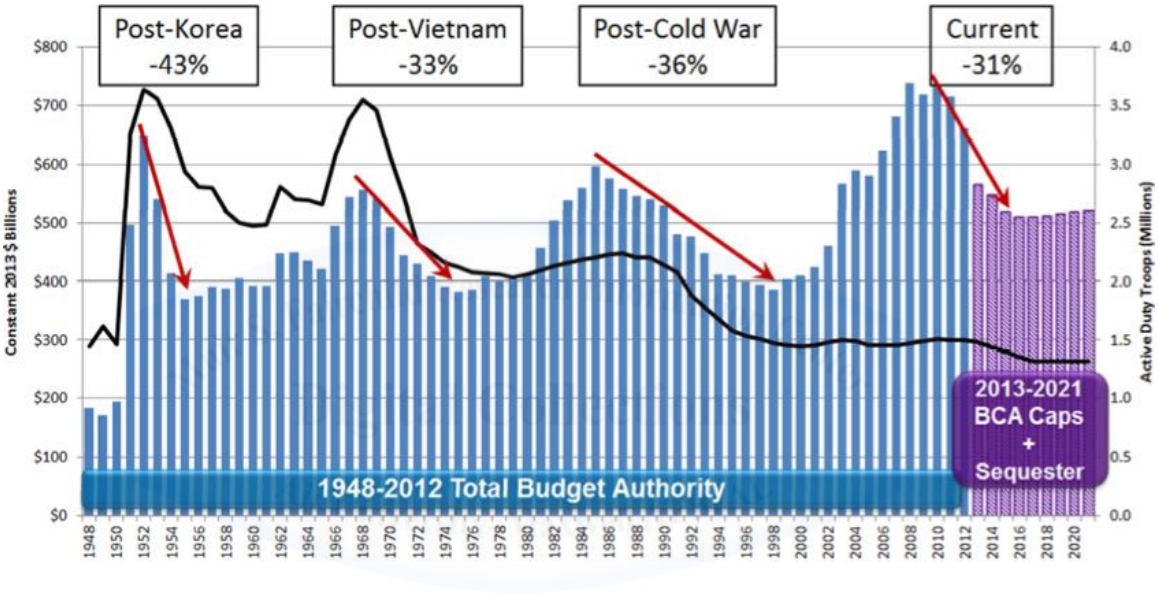

Figure 1. Defense Drawdowns Compared

Source: CSIS, *The Defense Budget's Double Whammy: Drawing Down While Hollowing Out from Within, October 18, 2012.*

Although the USAF failed to secure additional funding for the F-22 program, shifting strategic priorities continued to place an insatiable demand on combat airpower. The events of 9/11 redefined national defense priorities. Al Qaeda became the nation's preeminent security threat leading the US into a protracted counterinsurgency (COIN) and counter terrorism (CT) war. The CAF supported ground operations in

[21] Grant, *Combat Air Forces in Crisis,* 6.
[22] Niemi, *The F-22 Acquisition Program, 60.*

Iraq and Afghanistan, while the remaining force assumed responsibility for the Air Sovereignty mission. The 2010 Quadrennial Defense Review (QDR) stated "that the U.S. homeland is no longer, as it was even in the middle the last century, a sanctuary in the event of U.S. involvement in conflicts abroad."[23] Rather, the QDR report implies, "the global reach of new technologies may turn the U.S. homeland into a theater of operations, and measures to protect the homeland, therefore, must be planned for as part of any major conflict."[24] Not since the bombing of Pearl Harbor had the US placed so much concern on defending the homeland.

Lacking a robust missile defense system, the US air sovereignty mission falls on the shoulders of the fighter force. While few envisioned a post-Cold War environment with air patrols for national defense, Operation Noble Eagle (ONE) missions have placed significant strain on an aging fleet. Since September 2001, high alert postures have persisted while fighters patrolled major metropolitan areas and provided air cover for the POTUS and high visibility events like space shuttle launches in Cape Canaveral.[25] Often requiring 24-hour coverage, air sovereignty has all but stripped the legacy fighter fleets ability to sustain flying operations. A January 2009 Government Accountability Office (GOA) report found that if aircraft are not replaced within the next few years, 11 of the 18 current air sovereignty alert (ASA) locations could be without viable aircraft by 2020.[26] According to Lieutenant General Field's 2013 presentation of Defense Combat Aviation Programs to the House Armed

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[23] Stephen Daggett, *Quadrennial Defense Review 2010: Overview and Implications for National Security Planning*, R41250 (Congressional Research Service, May 17, 2010).
[24] Dagget, *Quadrennial Defense Review 2010,* 3.
[25] Grant, *Combat Air Forces in Crisis.* 18.
[26] Grant, *Combat Air Forces in Crisis* . 18

Services Committee, the fighter force has flown almost 64,000 ONE sorties since 9/11.[27]

Figure 2 highlights the current fighter inventory by year of delivery and service life expended. The average age of fighter aircraft began to increase after the Gulf War drawdowns and has continued as a result of decreased acquisitions in the years that followed. In 2008, the F-15, comprising 55 percent of the Air Superiority force, exceeded 70 to 100 percent of its service life. More than 35-years old, on average, the F-15 is projected to remain in operation until 2035 with the appropriate airframe service life extensions.[28]

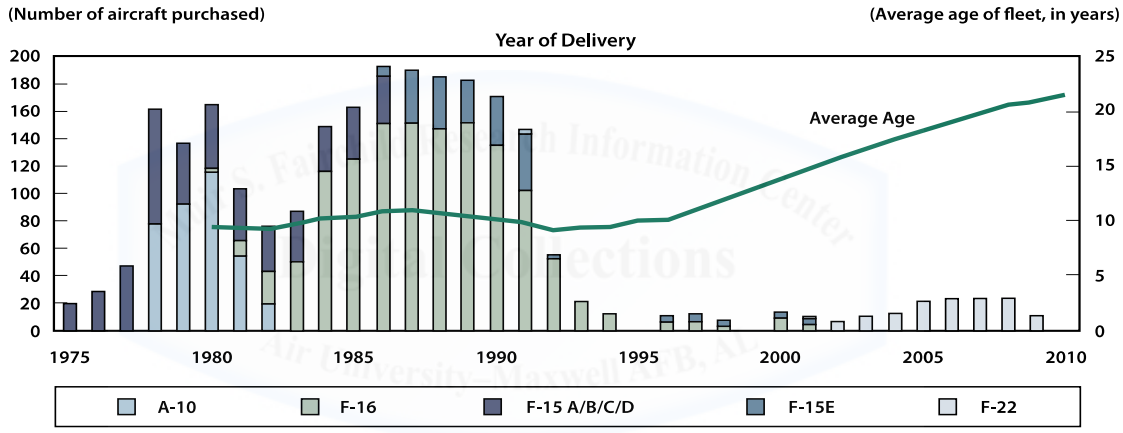

Figure 2. Air Force Fighter Inventory and Service Life Expended.
Source: CBO, *Alternatives for Modernizing U.S. Fighter Forces, May 2009.*

In lieu of dwindling defense spending and shifting strategic priorities, many defense officials argue the F-22 is not worth the cost. In 2009, Secretary Gates unveiled a defense budget that represented the first comprehensive attempt to rethink and reorient defense policy in

[27] Lieutenant General Burton M. Field, "Presentation to the House Armed Services Committee Subcommittee on Tactical Air and Land Forces, U.S. House of Representatives."
[28] Lieutenant General Burton M. Field. 6

light of the Iraq and Afghan wars.[29]c While the F-22 was at one point the USAF's single greatest priority, Keith Shimko concludes that Gates felt either American dominance in the air is already so great that the F-22 would merely be "running up the score", or the threat it counters is too remote to justify the expenditure in lieu of more immediate needs.[30] Senator John McCain stated, "there is no purpose, no mission in Afghanistan or Iraq [for the F-22], unless you believe that al Qaeda is going to have a fleet of aircraft."[31] Many decision makers justified cancelling the F-22 by claiming it has never participated in combat despite wars in Iraq and Afghanistan and the U.S.-led no-fly mission over Libya. Capable of executing combat missions since IOC in 2005, the nation simply did not require its unique capabilities in those conflicts.[32] In the end, the F-22 was too expensive to produce in large numbers and too specialized to support the wars in Iraq and Afghanistan.[33]

While senior officials fought the F-22 battle, the USAF's legacy air superiority fighter experienced drastic cuts. Since 2001, the F-15C Active Duty (AD) fleet has been reduced by approximately 60 percent. Two squadrons at Eglin AFB, three squadrons at Langley AFB, two squadrons at Elmendorf AFB, a single squadron a Mountain Home AFB and three squadrons at Tyndall AFB all deactivated over the past decade – a total force reduction of 263 fighters.[34] In some cases, the USAF accelerated fighter drawdowns. In 2009, the USAF announced the early

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[29] Keith L. Shimko, *The Iraq Wars and America's Military Revolution* (New York, NY: Cambridge University Press, 2010). 232

[30] Shimko. *The Iraq Wars and America's Military Revolution,* 234.

[31] "Final F-22 Delivered," accessed February 17, 2014, http://abcnews.go.com/Blotter/final-22-fighter-delivered-sen-john-mccain-79b/story?id=16270127.

[32] Niemi, *The F-22 Acquisition Program,* 69.

[33] Niemi, *The F-22 Acquisition Program,* 70.

[34] Haffa, Robert P, *Full Spectrum Airpower: Building the Air Force America Needs* (The Heritage Foundation, October 12, 2012).

retirement of 48 F-15Cs stationed at Tyndall AFB.[35] Originally planned to remain the USAF's schoolhouse for F-15C training until 2013, the decision would save $355 million in FY 2010 and $3.5 billion over the next five fiscal years.[36] Drawing down the legacy air superiority fleet redefined the demographic composition of the force. Today, approximately 58 percent of the force - 87 of the total 153 - belongs to the air reserve component, including F-15C Formal Training Unit (FTU) responsibilities.

The strategic landscape over the past two decades has shaped and sized the air superiority force of today. Facing more than $500 billion in spending cuts over the next decade, further decline in the fighter force is inevitable. Although force structure and modernization efforts take years to correct, maintaining a readiness level to meet national security requirements with appropriate funding can be resolved in relatively little time. Under the current fighter force structure, many readiness indicators present challenges to the viability of the fighter force. Future plans to decrease F-15C numbers further could take place in FY 15 to make room for F-35 acquisition, which is not being designed replace the aging air superiority fighters. Nevertheless, an examination of the air superiority force can uncover issues caused by CAF reductions and provide a clear understanding of force capability.

By the Numbers

In April 2013, Lieutenant General Burton M. Field, USAF Deputy Chief of Staff for Operations, presented to the House of Armed Services Committee his assessment of the FY 2014 combat aviation programs. He highlighted several eroding readiness indicators, the most notable being the continued reduction in the fighter force. In 2011, the USAF determined through extensive analysis that a force structure of 1,200

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[35] "Air Force Accelerates Tyndall F-15 Drawdown," accessed February 27, 2014, http://www.tyndall.af.mil/news/story.asp?id=123150190.

[36] "Air Force Accelerates Tyndall F-15 Drawdown."

primary mission aircraft inventory (PMAI), those available for operational use, and 2,000 total aircraft inventory (TAI) was required to execute the National Military Strategy with increased levels of risk.[37] However, strategic guidance published in 2012 determined the USAF would accept additional risk by decreasing the total fighter structure by another 100 aircraft, resulting in 1,100 PMAI and 1,900 TAI.[38] In comparison, during Operation Desert Storm, the USAF committed 655 of its 2,798 total fighter inventory - approximately 23 percent.[39] Today, the fighter force is 60 percent smaller than the force of 1991.

Curtailed F-22 production and the divestments of a large portion of the F-15C fleet have not only decreased the size of the air superiority force, but also led to a change in the strategic location and the internal composition of the fighter wing equivalent. Under Total Force Integration (TFI), which includes the USAF Active Duty and Air Reserve component, the fighter force has been reduced from 36 fighter wing-equivalents (FWE) at the time of the Gulf War, to the 2010 QDR established requirement of 16-17 FWE today.[40] Of those, only 6 FWE fulfill the air superiority mission.[41] However, in the four years since the last QDR set the requirement for the number of wings, the USAF has also decreased the size and composition of fighter wings.

Historically, a fighter wing consisted of three squadrons of 24 aircraft each. Today, a fighter wing is significantly smaller. Typical Regular Air Force (REG AF) F-22/F-15C wings have two squadrons of 21-24 PMAI, with the exception of Lakenheath, which has only 18 PMAI. Typical ANG/ARC wings have a single squadron, comprised of 18 PMAI,

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[37] Lieutenant General Burton M. Field. 5

[38] Lieutenant General Burton M. Field. 4

[39] A Statistical Compendium and Chronology, *Gulf War Air Power Survey*, vol. Vol V (Washington D.C., 1992).

[40] *Quadrennial Defense Review Report* (Department of Defense, February 2010). Fighter Wing Equivalent is 72 primary mission aircraft inventory (PMAI) per wing, typically comprised of 3 squadrons of 24 aircraft each.

[41] 2010 QDR. 47.

with the exception of the California ANG located in Fresno, which has only 15 PMAI. As a result, the size of the fighter wing is approximately 35 percent smaller than those of the previous era. Figure 3 depicts F-22/F-15 force structure.

F-15 C-D							
PACAF	**UNIT**	**PMAI**	**PTAI**	**PDAI**	**BAI**	**A/R**	**TAI**
KADENA, JA	18 FW/44 FS	24			2	0	26
KADENA, JA	18 FW/67 FS	24			2	1	27
		48	**0**	**0**	**4**	**1**	**53**
USAFE	**UNIT**	**PMAI**	**PTAI**	**PDAI**	**BAI**	**A/R**	**TAI**
LAKENHEATH, UK	48 FW/493 FS	**18**	**0**	**0**	**2**	**1**	**21**
ANG	**UNIT**	**PMAI**	**PTAI**	**PDAI**	**BAI**	**A/R**	**TAI**
BARNES, MA	104 FW/131 FS	18			2	1	21
FRESNO, CA	144 FW/194 FS	15			2	2	19
JACKSONVILLE, FL (AD)	125 FW/159 FS	18			2	1	21
PORTLAND, OR (AD)	142 FW/123 FS	18			1	2	21
NEW ORLEANS, LA	159 FW/122 FS	18			2	1	21
		87	**0**	**0**	**9**	**7**	**103**
TOTAL		***153***	***0***	***0***	***6***	***2***	***177***
F-22A							
ACC	**UNIT**	**PMAI**	**PTAI**	**PDAI**	**BAI**	**A/R**	**TAI**
NELLIS, NV	53 WG/422 TS			12	2		14
LANGLEY, VA	1 FW/27 FS	21			2		23
LANGLEY, VA	1 FW/94 FS	21			2		23
TYNDALL, FL	325 FW/95 FS	21			2		23
TYNDALL, FL	325 FW/43 FS	0	28	0	3	0	31
		63	**28**	**12**	**11**	**0**	**114**
PACAF	**UNIT**	**PMAI**	**PTAI**	**PDAI**	**BAI**	**A/R**	**TAI**
ELMENDORF, AK	3 WG/90 FS	21			2		23
ELMENDORF, AK	3 WG/525 FS	21			2	**1**	24
		42	**0**	**0**	**4**	**1**	**47**
ANG	**UNIT**	**PMAI**	**PTAI**	**PDAI**	**BAI**	**A/R**	**TAI**
HICKAM, HI	154 FW/199 FS	**18**	**0**	**0**	**2**	**0**	**20**
TOTAL		***123***	***28***	***12***	***17***	***1***	***181***

Primary Mission Aircraft Inventory (PMAI) – Aircraft assigned for performance of a mission. Primary Training Aircraft Inventory (PTAI) – Aircraft assigned for training and aircrew qualification. Primary Development Aircraft Inventory (PDAI) – Aircraft assigned for test and evaluation. Backup Aircraft Inventory (BAI) – Aircraft in addition to primary aircraft that permit maintenance without detriment to the mission. Attrition Reserve (A/R) – Aircraft reserved for anticipated damage or loss. Total Active Inventory (TAI) – The sum of all categories.

Figure 3. FY 13 Air Superiority Force Structure

Source: ACC A589/8XX, 15 January 2014.

CAF reductions have also impacted the geo-strategic positioning of air superiority forces. With only four operational F-22 locations, the implications of committing forces to a major theater operation may leave strategic vulnerabilities previously not encountered within the national defense strategy. ANG/ARC F-15Cs support the preponderance of the homeland defense mission, while the majority of the REG AF fleet is located in Japan in support of Pacific region security. The 493 Fighter Squadron, located at Lakenheath, England, is the only US air superiority squadron on the European continent. The 493 FS is responsible for mission support to European Command (EUCOM), Africa Command (AFRICOM), and NATO demands, with only 18 PMAI worth of F-15s, this is a prime example of a reduced force without a reduction in responsibility.

Air Superiority Availability

While the size of the CAF has decreased, the high demand for operational air superiority fighters in support of Combatant Commanders (COCOMs) has remained constant. Consistent deployments to CENTCOM and PACOM AORs are impacting readiness levels due to the lack of training accomplished by units when in theater. Deploy-to-dwell times, or the ratio of time deployed versus time not deployed, are exceeding guidance ratios under the current force structure.[42] The Under Secretary of Defense for Personnel and Readiness has recently revised deploy-to-dwell ratios to characterize and manage the employment of the Total Force to preclude the overexposure of personnel to combat and operational deployments.[43] The guidance affirms the

[42] *National Commission on the Structure of the Air Force*, Report to the President and Congress of the United States, January 30, 2014. 5

[43] *National Commission on the Structure of the Air Force.* 15

deploy-to-dwell ratio for the Active Component is set at 1:2 or greater, however some F-22 and F-15C squadrons are meeting 1:1 or greater deploy-to-dwell ratios. In response to increasing dwell ratios, the USAF conducted a top-down review.

In July 2011, Air Combat Command (ACC) executed a command directed readiness review of the CAF. The results confirmed dwell rates as a primary indicator of sustainability and readiness.[44] The problem with the dwindling fighter force structure exists from the tension between the unconstrained demands of the COCOMs and the resources available to support them.[45] The readiness review concluded that a decrease in the number of fighters, primarily a result of the FY10 POM reduction of 249 F-15C, F-16 and A-10 platforms, without a commensurate drop in demand downrange, meant that units are deployed more often and stay for longer periods of time.[46] USAF senior leaders clearly understand the impacts of dwell rates, but the manner in which deployments are conducted is problematic for the CAF.

According to the 493 FS Commander, dwell time is "killing his squadron."[47] Gone more than half of 2013, the 493 FS is exceeding a 1:1 dwell that is "crushing" readiness.[48] Air policing and air patrols in support of COCOM demands consistently drain training resources and place a significant strain on pilots and maintenance personnel. "There are not enough resources to make it happen and we don't have the capacity to support the demands."[49] Flying configurations with live munitions, pilots are confined by regulations to low fidelity mission sets that lead to the erosion of combat skills. "The quantity of flying is not an

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[44] "2012 ACC History Readiness Extract" (Air Combat Command, June 2012).
[45] "2012 ACC History Readiness Extract"
[46] "2012 ACC History Readiness Extract"
[47] Renegar, Lendy G, 493 FS Commander, *Interview*, February 6, 2014.
[48] Renegar, *Interview*
[49] Renegar, *Interview*

issue for the 493 FS, rather it is the quality of flying that is severely impacting readiness."[50]

Additional strain on the air superiority force comes from executing split deployments in support of multiple taskings. For example, more than one six-ship deployment to separate locations severely limits training primarily due to limited sortie production and red air availability. The F-22 and F-15C syllabus requirements dictate training in out-numbered scenarios. However, during a split-ops deployment, maintenance can typically only generate a 4 T 2 - or four sorties during the first flying window, and 2 sorties during the second - for the daily flying schedule.[51] According to a former F-22 squadron commander, split deployments were impacting readiness in his unit as well. Instead of full squadron deployments, comprised of 12 jets and all assigned operations and maintenance personnel, units are deploying only six jets in support of COCOM directives. Limited on number of aircraft, deployed maintenance personnel, and training resources, pilots are limited to basic training scenarios that do not include skill sets required to execute successfully in a contested and degraded environment.

The F-22 community is experiencing similar deploy-to-dwell ratios resulting in deceased training quality. According to the 325th Operations Group Commander, F-22 units are deployed so much that they cannot train downrange or back home.[52] Active Component F-22 units are executing a 1:1 deploy-to-dwell ratio in support of COCOM requirements. In addition, national security matters rely heavily on F-22 presence through theater security packages (TSPs). On several occasions, F-22 squadrons have sent large footprint packages to the Pacific region for several months. Limited training opportunities while deployed, similar to those experienced by the 493 FS, impact F-22 readiness. While

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[50] Renegar, *Interview*

[51] Renegar, *Interview*

[52] Marosko, Max M., 325 OG/CC, *Interview*, January 25, 2014.

demanding COCOM requirements impact the number of aircraft available to support contingency operations, the inability to produce enough sorties has also plagued the F-22/F-15C communities.

CAF reductions have had a drastic impact on home station F-15C sortie production. The 493 FS requires 3,000 sorties annually to complete the Ready Aircrew Program (RAP) tasking message and provide all Combat Mission Ready (CMR) and Basic Mission Capable (BMC) pilots the minimum level of proficiency with an 18 PMAI.[53] This necessitates flying 250 sorties per month to meet RAP. To account for historical attrition rates that average 25 percent, maintenance schedules 320 sorties per month to accomplish the 250 required.[54] However, 250 sorties are not sufficient to complete the desired training plan, or the annual cycle that fulfills training requirements within the Designed Operational Capability (DOC) statement.[55] To build up to more advanced training scenarios, the squadron must generate enough sorties to support high-quality training. However, in an 18 PMAI squadron, maintenance can only realistically sustain a 10 T 8 flying schedule.

For example, to accomplish a 4-ship training mission with 6 adversaries, the entire 10 front lines are required to meet syllabus requirements. However, this provides zero flexibility to accomplish the required training during high attrition periods. Ultimately, "maintenance cannot generate enough sorties to meet proficiency levels because there is not enough metal."[56] A 12 T 10 would meet training plan requirements, but generating that amount of sorties is unsustainable given the amount of resources available. In delivering 12 front lines, regulations require maintenance to produce 4 spare aircraft, accounting for 16 of the 18 total aircraft. Due to maintenance DEPOT and phase

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[53] Renegar, *Interview*
[54] Renegar, *Interview*
[55] Renegar, *Interview*
[56] Renegar, *Interview*.

requirements, sortie production at that level is impossible. The 493 FS can be mission ready IAW the RAP tasking message, but not in the Status of Resources and Training (SORTS) and Defense Readiness Reporting System (DRRS) because the number of available aircraft did not permit flying outnumbered.[57] The 493 FS is best-equipped and trained for low intensity operations against a legacy threat, but not high-end operational demands.

The root cause underlying F-22 readiness levels resides at the FTU. The biggest problem for Tyndall Raptors is sortie production. Although the number of aircraft is not determinate in generating sorties, aircraft utilization (UTE) rates are drastically lower than originally planned. With a 28 primary training aircraft inventory (PTAI), the 325 FW has plenty of metal to support flying operations, however maintenance cannot produce enough sorties for pilots to meet basic levels of proficiency, much less complete AETC syllabus training requirements. Although UTE rate are much better in operational F-22 squadrons, poor maintenance trends at the FTU have CAF-wide impacts.

Typical to new airframes, maintenance trends tend to improve over the course of time as the weapon system matures and personnel refine maintenance practices. However, the limited production run of the Block 10 version of Tyndall F-22s induced an economy of scale that is disadvantageous to the cost of maintenance.[58] According to the 325 OG/CC, the Raptor was produced in such small numbers that maintainers do not have access to enough parts.[59] Greater break rates without the capacity to replace parts precludes sortie production to the level required to execute training programs.[60] Preplanned UTE rates of

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[57] Renegar, *Interview*
[58] Marosko, *Interview.*
[59] Marosko, *Interview.*
[60] Marosko, *Interview.*

20 percent are actually around 10 percent, meaning individual airframes are flying 10 times per month – 50 percent less than planned.[61]

To ensure a balance of experience in the F-22, Tyndall must produce B-course graduates in conjunction with TX pilots - those who require requalification training or who are transitioning from another airframe. However, due to limited sortie generation, the training demands to produce young fighter pilots pose a significant cost in pilot output. The amount of sorties required to produce one B-course graduate is the same required to produce three TX graduates.[62] The inability to produce enough qualified people directly impacts the next variable of readiness – pilot availability.

Fighter Pilot Availability

The USAF is enduring a fighter pilot shortage of significant proportions which is projected to be much worse in the future. Currently the CAF is short 200 fighter pilots, and this shortage could increase to over 700 by FY 2020.[63] While retention rates reach alarmingly low numbers, the USAF is struggling to maintain its most valued people. Although the CAF has endured retention issues before, the impact on readiness is concerning.

According to the former 525 FS Commander, the biggest limitation to F-22 readiness is the lack of adequate manning. Due to F-22 sortie production limitations at Tyndall AFB, the capacity to produce pilots is not sufficient to man operational fighter squadrons. If the entire 21 PMAI F-22 squadron from Elmendorf AFB were to deploy to a major theater operation, there would not be enough assigned pilots to execute the mission.[64] Deployed operations required a 2:1 pilot to aircraft ratio to

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[61] Marosko, *Interview.*

[62] Davis, Robert, *Interview*, February 26, 2014.

[63] "The Air Force Is Facing a Pilot Shortage Crisis" (The Aerospace Defense and Learning Institute, June 23, 2013).

[64] Davis, *Interview.*

meet operational demands.[65] Manned at roughly 60-70 percent, a 12-ship deployment with only 17-18 assigned pilots is unsustainable.[66] Functional positions in the squadron are "1-deep" and deployment demands often make home station operations impossible. From the perspective of manning, "the USAF only has one and a half squadrons worth of operational capability at Elmendorf AFB."[67]

The 493 FS has 25 pilots assigned and 8 pilots attached filling OSS, Group and Wing functions. To meet the RAP tasking message, 18 pilots per day are required to fill the schedule. Although the squadron is 90 percent manned, pilot availability provides "zero flexibility for quality of life.[68] "Unless we reduce flying operations that are already meeting the minimum requirement, my people cannot take leave, go on career-broadening TDYs, or are allowed to get sick."[69] With only two operational locations, F-15C manning levels are not as severe as F-22 manning, however more manpower would improve readiness.

Realistic Combat Training

The quality of training is a function of operational demands, insufficient numbers of fighters to fulfill training aids, and the lack of funding of high-fidelity training exercises historically regarded as the most demanding scenarios short of war. While home-training insufficiencies impact proficiency, high-fidelity exercises that provide advanced, realistic combat scenarios are on the decline.

The most advanced combat training exercise is conducted at Red Flag. Established in response to the CAF's marginal performance during the Vietnam War, Red Flag' s mission is to provide realistic and relevant training through integrated warfighting in a contested, degraded, and

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[65] Davis, *Interview*.
[66] Davis, *Interview*.
[67] Davis, *Interview*.
[68] Renegar, *Interview*.
[69] Renegar, *Interview*.

operationally limited environment. To ensure fighter pilots we receiving the right amount of training, the USAF conducted a study in 1975 called Project Red Baron II. The results found that a pilot's chance of survival increased dramatically after completing 10 combat missions.[70] Therefore, Red Flag was designed to provide pilots 10 combat training sorties over the course of a 3-week period. However, the current frequency of exercise participation and sortie count per pilot is significantly lower than originally proposed.

Over the past five years, CAF reductions have impacted the frequency in which units participate in Red Flag. Historically, units would attend Red Flag every twenty months on average and provide 10 training sorties. Today, Red Flag hosts units every forty months on average and pilots average only 5 sorties per exercise. According to the 493 FS/CC, the last time the 493 FS attended Red Flag was more than 3 years ago.[71] "Red Flag is the only place I get to fly big LFE's and high fidelity training scenarios."[72] In fact, Red Flag records indicate the 493 FS is averaging 48 months between exercise participation, one of the longest absentees from the northern ranges of Nellis AFB.[73] F-22 Red Flag participation is also below average. Only two of the seven operational squadrons have been to Red Flag in the past two years, while the remaining squadrons average 48 months between exercises.[74]

Decreasing unit participation in Red Flag has significant impacts on readiness. Most operational assignments range from 24-36 months. With an average Red Flag refresh rate of 40 months, a greater proportion of pilots will not attend Red Flag during their operational assignment. Furthermore, the frequency of attendance at the current rate could mean

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70 "The Value of Red Flag," (Power Point, November 27, 2013).
71 Renegar, *Interview*.
72 Renegar, *Interview*.
73 "The Value of Red Flag."
74 "The Value of Red Flag."

that a significant portion of fighter pilots would never attend Red Flag during an eight-year period of operational duty. In the 2010 United States Air Force Weapons School (USAFWS) class, only 50 percent of students had Red Flag experience.[75] Project Red Baron II analysis revealed that 10 combat missions significantly increase survival rates, however, a large proportion of weapons officers, those who are trained to prepare and train their squadrons for war, have not experienced it. Fewer Red Flag exercises also contribute to the readiness problem. In recent years, four exercises have been executed per year, however under current sequestration laws the USAF is only executing two.[76]

Conclusion

In 2011, former Air Combat Command Director of Operations, Major General Charles W. Lyon, ACC/A3, looked at CAF flying hour statistics and recognized some alarming trends. The CAF was flying fewer hours and units were not executing the hours they were given.[77] CAF squadrons were not filling readiness requirements that DOC statements called for. In 2012, less than 12.5 percent of ACC's fighter squadrons achieved the standard to be declared minimally ready to perform their primary C-NAF missions, much less their secondary missions.[78] The following year, similar reports revealed that only 23 percent of fighter missions were flown to RAP standard minimums.[79]

The US fighter force today is 60 percent smaller than the force in 1991. Driven by service efforts to procure fifth generation all stealth fighters, the Department of Defense implemented deep cuts in the early 90s to the fighter force to prioritize a modern, more capable force. Post-Gulf War "peace dividends" and reductions in military spending impacted

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[75] Lyon, Maj Gen Charles W, "Corona South 2012," accessed January 10, 2014.
[76] Lyon, *interview*.
[77] Lyon, *interview*.
[78] "2012 ACC History Readiness Extract."
[79] ACC, *Air Combat Command End of Year Readiness Review*, November 19, 2013.

the USAF's ability to purchase a fighter force that is "right sized" to meet the national military strategy. Realigning defense priorities, declining budgets, sequestration laws, and political resistance to recapitalizing combat aviation have had major impacts on the size and readiness of the fighter force. Ultimately, readiness is impacted by the lack of aircraft, demanding dwell ratios, the inability to produce sufficient training sorties, insufficient manpower, and the low frequency of high-fidelity training. General Corley stated that air dominance was America's asymmetric advantage, however, the evidence presented here confirms the CAF is indeed on the "slippery slope."

Chapter 3

The CAF of Yesteryear

Operation Desert Shield (ODS) represented the culmination of years spent revitalizing an ailing post-Vietnam CAF into a modernized, superiorly trained fighter force. In less than six weeks, the air campaign drove the Iraqi Air Force out of the sky and destroyed Iraqi ground forces to the point where even the elite Republican Guards retreated back to Baghdad.[1] The F-15C Air Superiority fighter posted a perfect aerial combat record with 34 confirmed kills, and the USAF lost only 14 aircraft to Iraqi ground defenses.[2] Exploiting a combination of technological superiority and skill, many argue the CAF was more prepared to fight major combat operations than ever before. As the US emerged from the Gulf War, the CAF demonstrated a new kind of aerial warfare that many claimed had wiped clean the memory of the Vietnam War.[3]

The purpose of this chapter is to identify the CAF resources available to and employed by the USAF during Gulf War I. It will begin by analyzing the pre-Gulf War strategic landscape, the national defense strategies, and USAF leadership that impacted the size, composition and readiness of the air superiority fighter fleet of 1991. Next, it will address aircraft and pilot availability in conjunction with sortie production rates that led to high levels of proficiency and enhanced states of readiness. Finally, it will highlight CAF training measures taken in the years preceding ODS that were instrumental in developing the force responsible for executing one of the most successful air campaigns in modern military history.

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[1] Grant, Rebecca, *Losing Air Dominance*, A Mitchell Institute Special Report (Mitchell Institute Press, September 2008). 8.

[2] Grant, *Losing Air Dominance,* 8.

[3] Keith L. Shimko, *The Iraq Wars and America's Military Revolution* (New York, NY: Cambridge University Press, 2010). 31

The "Never Again" Force

The years following the Vietnam War were among the most difficult in the history of the U.S. military. During the war, the USAF air-to-air kill ratio was only 2 to 1, and more than 665 aircraft were lost over the seven-year conflict.[4] Post war assessments by the USAF made it clear where the problem was – lack of training.[5] Military officers participating in Vietnam, who would eventually play an instrumental role in the first Gulf War, were deeply affected by the failure and were determined to avoid a repetition.[6] "Never again" was the common refrain within the military. The USAF was driven to revive combat airpower after being battered by more than a decade of an increasingly unpopular and ultimately unsuccessful war.[7] As soon as the war was over, the USAF began a dramatic shift in its tactics and training programs that laid the foundation for a rejuvenated fighter force. By 1991, the transformation of American airpower led President Bush to state, "by God, we've kicked the Vietnam Syndrome once and for all."[8] However, the transformation of combat airpower did not occur overnight.

The hangover of the Vietnam War drastically impacted CAF readiness levels. In 1969, in the midst of the conflict, Tactical Air Command (TAC) fighters were flying, on average, 23 sorties and 32 hours per month.[9] Nearly a decade later in 1978, fighter aircraft were flying 11.5 sorties per month for only 17 hours – a reduction of 50 percent

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[4] "The Value of Red Flag," (Power Point, November 27, 2013).

[5] Marshall L Michel, *Clashes: Air Combat over North Vietnam, 1965-1972* (Annapolis, Md.: Naval Institute Press, 2007). 10.

[6] Shimko, *The Iraq Wars and America's Military Revolution*. 32.

[7] Shimko, *The Iraq Wars and America's Military Revolution,* 35.

[8] Benjamin S. Lambeth, *The Transformation of American Air Power*, Cornell Studies in Security Affairs (Ithaca, N.Y: Cornell University Press, 2000). 56.

[9] James C Slife, Air University (U.S.), and Research, and Education College of Aerospace Doctrine, *Creech Blue: Gen Bill Creech and the Reformation of the Tactical Air Forces, 1978-1984* (Maxwell Air Force Base, Ala.: Air University Press in collaboration with CADRE, 2004). 23

(almost 8 percent annually).[10] Eerily similar to the CAF today, the reduction in flying training had a tremendous impact on pilot proficiency. Requiring a minimum of 15 hours of flying per month, aircrews were receiving less than 10 hours on average.[11] Maintenance quality declined and drastically impacted the ability to accomplish the mission. One pilot disputed that it if the airplane was safe to fly, many of the major system components, like the radar, were inoperative.[12] As a result, very little quality flying training took place. TAC's insidious decline was what General Bill Creech would describe as the "slippery slope". Figure 4 depicts UTE rates for all fighters from FY 69 thru FY 84.

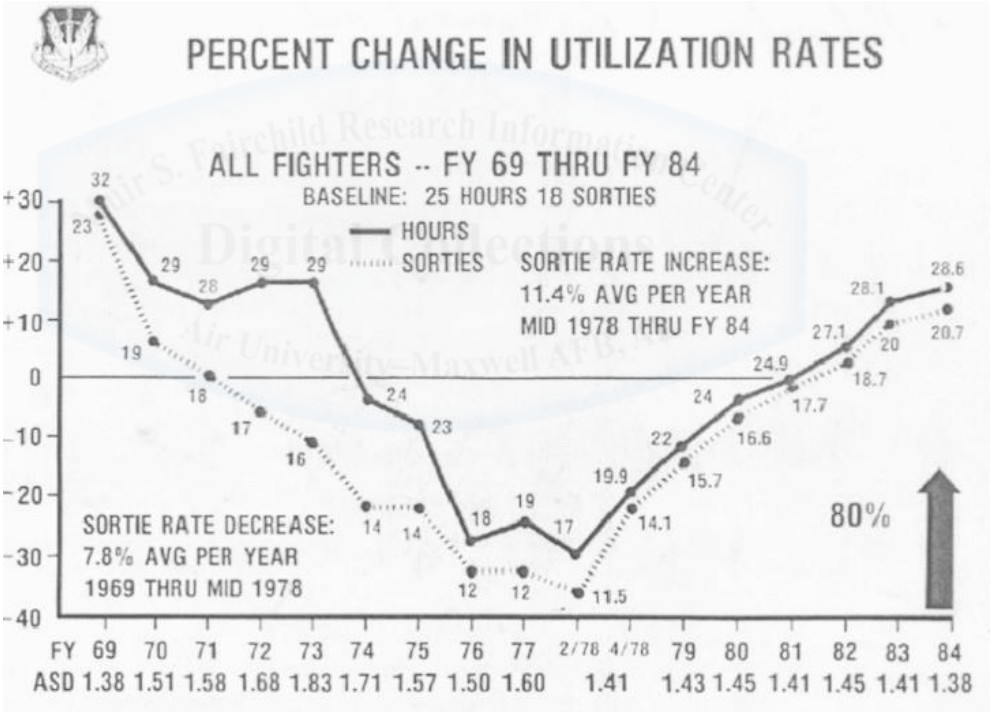

Figure 4. The Slippery Slope

Source: *Corona South, 2012*

[10] Slife, *Creech Blue: Gen Bill Creech and the Reformation of the Tactical Air Forces* , 23.
[11] Slife, *Creech Blue: Gen Bill Creech and the Reformation of the Tactical Air Forces*, 23.
[12] Slife, *Creech Blue: Gen Bill Creech and the Reformation of the Tactical Air Forces,* 23.

However, by 1978, the CAF began to rebound from the symptoms of a "hollow force". Sortie numbers and flying hours increased by 80 percent over the next decade. By 1984, the fighter force, replenished by new airframes and an abundance of flying hours, evolved into a ready, well-trained force. To accomplish this task, the USAF relied on a top-down approach that incorporated several key initiatives. First, the USAF leveraged national security strategy directives that were supported by rearmament programs of the Carter and Reagan administrations. These persistent strategic directives, which spanned the late-1970s and early-1980s, included achieving high readiness postures, providing adequate operational sustainability, and modernizing force structure.[13] Second, USAF leaders began the development of operational joint doctrine that placed a high demand on tactical airpower. Finally, the USAF revitalized training programs by implementing realistic combat scenarios through the conduct of Large Force Exercises (LFEs). Although the threat of nuclear war remained the most significant security concern, the US also needed a stronger conventional military force.

The Cold War cast a long shadow over the period between the Vietnam War and Gulf War I. While the US was preoccupied in Indochina, the Soviet threat continued to expand. Whatever nuclear advantage the US enjoyed before the Vietnam War had evaporated – by the late 1970s it was faced with the reality of Soviet nuclear parity.[14] Despite President Nixon's pursuit of *détente,* many saw the growth of Soviet conventional military forces as the most pressing challenge to national defense.[15] According to DoD figures in the 1970s, the Warsaw Pact outnumbered NATO in just about everything, including tactical

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[13] "US National Security Strategy" (The White House, May 20, 1982), http://www.reagan.utexas.edu/archives/reference/Scanned%20NSDDS/NSDD32.pdf. 5

[14] Shimko, *The Iraq Wars and America's Military Revolution*, 32.

[15] Shimko, *The Iraq Wars and America's Military Revolution,* 35.

aircraft.[16] In fact, the Soviet advantage in fighter aircraft was on the order of two- or three-to-one and most feared the margin exceeded what was necessary to defend against a Soviet attack.[17] Thus, policy makers understood the significance of the Soviet threat and developed new guidance.

National security directives during the inner-war period laid the foundation for fighter force innovation. Consistent with previous strategic directives following the Vietnam War, the guidance was structured around protecting US interests from the Soviet Union. The central tenant of the defense policy was not to seek to match the Soviet Union weapon for weapon, rather it was to overcome Soviet numerical superiority by taking advantage of the inherent strengths a democratic, industrialized, free-market economy – technological superiority and the strength of the individual.[18] In doing so, the US sought to make portions of the Soviet military machine obsolete by forcing them to divert resources.[19] To fulfill this national security requirement, the US needed a force to enhance its deterrent value.

To meet the goals of conventional deterrence, the US focused on a robust forward deployed defense capability and the maintenance of adequate active forces.[20] Significant US military presence across the European continent remained vital to strategic deterrence and led to significant improvements in operational capability. In 1974, additional construction and modification of Bitburg Air Base, Germany, took place to accommodate USAFE's first operational F-15 squadron, the 525 TFS,

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[16] Shimko, *The Iraq Wars and America's Military Revolution*, 35.
[17] Shimko, *The Iraq Wars and America's Military Revolution*, 45.
[18] "National Security Strategy of the United States" (The White House, January 1987).
[19] "National Security Strategy of the United States, 1987".
[20] "National Security Strategy of the United States, 1987".

which arrived in April of 1977.[21] The following year maintenance hangar construction began that would house avionics shops and other support operations.[22] By the mid-1980s, European USAF presence extended to ten bases in Germany, nine bases in the United Kingdom, three bases in Turkey and two bases in Denmark and Spain.[23] While the US obtained strategic depth with its overseas bases, it still needed a balanced force.

To fulfill the requirements of national security, the US sought to maintain "balanced and effective active forces of sufficient quality and quantity."[24] In particular, tactical airpower could support ground force goals only by maintaining a formidable air superiority capability.[25] Furthermore, the US understood the requirement for a rapidly deployable force. The 1987 National Security Strategy directed air forces capable of deploying rapidly in crises to enhance the ability to deter threats to US interests in distant areas, and to bring effective military power to bear should deterrence fail."[26] Finally, the US sought to develop a balanced, ready fighter force by avoiding excessive demands on personnel. "Our peacetime operational tempo, forward deployments, and our general strategy of deterrence all require a substantial, balanced and ready active duty military establishment."[27] While the 1987 NSS clearly outlined strategic objectives, perhaps its most important contribution came by matching strategic intent with sufficient resources.

The successful execution of any strategy depends on the availability of adequate resources. The 1987 NSS highlighted the imperative of matching strategy to resources by stating that "strategies

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[21] Harry R. Fletcher, *Air Force Bases, Volume II. Air Force Bases Outside the United States of America* (Washington D.C.: United States Air Force Historical Research Agency, 1993). 15

[22] Fletcher, *Air Force Bases, Volume II,* 16.

[23] Fletcher, *Air Force Bases, Volume II,* 209-210.

[24] "National Security Strategy of the United States, 1987."

[25] "National Security Strategy of the United States, 1987."

[26] "National Security Strategy of the United States, 1987."

[27] "National Security Strategy of the United States, 1987."

which depend on unrealistic or unachievable assumptions about resources availability are doomed to fail."[28] In addition, the element of time played a significant role in strategic guidance. The days when nations could respond to security crises by raising, training and equipping new forces were gone, and a nation's deterrent value now came to be measured in large part by its ability to deploy military forces rapidly.[29] Perhaps the most important aspect of matching strategic objectives to available resources is ensuring military force can in fact deter war. "Military forces which are unsuccessful in deterring major war fail the first test of adequacy."[30] As a result, the USAF was equipped with strategic guidance directives that laid the foundation for innovation measures that recapitalized American airpower. With strategic directives in mind, the USAF now focused on revitalizing its operational doctrine.

One of the lessons learned from the Vietnam War was the imperative to integrate airpower to meet the ground force commander's objectives. This included matching military assets to tasks through more effective concepts of operations and force employment strategies at the theatre level.[31] Newly referred to as the "operational level" of war, the USAF and US Army understood the imperative of joint operations in war. General Robert J. Dixon, former TAC commander, and General William Depuy, commander of the Army's Training and Doctrine Command (TRADOC), established a cooperative effort in October 1973 to develop concepts, procedures and tactics that would optimize the efficiency of air and ground forces.[32] What ultimately resulted was the evolution of AirLand Battle (ALB) Doctrine.

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[28] "National Security Strategy of the United States, 1987."
[29] "National Security Strategy of the United States, 1987."
[30] "National Security Strategy of the United States, 1987."
[31] Lambeth, *The Transformation of American Air Power*, 83.
[32] Lambeth, *The Transformation of American Air Power*, 83.

According to former TAC Commander General Creech, a major initiative involving a fundamental conceptual change within the CAF was the development of ALB.[33] Designed to counter the large Soviet force, it conceived a very broad battlefield that required air supremacy and interdiction in conjunction with "deep battle" conducted by ground forces.[34] Discounting set-piece battles, ALB implemented a new form of maneuver warfare requiring a flexible and robust air superiority fighter force. USAF fighters would be required to gain and maintain air superiority over a greater expanse of the battlefield, and for extended periods of time. Although ALB was plagued with indecision over the role of airpower in support of the ground component, its acceptance within the services set the requirement for a larger, more robust CAF.

The dynamic pursuit of technologically advanced fighter platforms in the two decades that separated Vietnam and Desert Storm epitomized the CAF's desire for a new and improved fighter force. However, unlike the 1990's development and acquisition of an "all stealth" force via the F-22, the USAF sought multiple platforms to compliment the fighter inventory. Leading fighter modernization efforts in the air superiority mission was the introduction of the F-15. Designed around new air intercept (AI) radar technology that provided multi-track and multi-targeting capability, the F-15 offered capabilities well beyond the Soviet fighters, including the MiG-29.[35] Moreover, advances in power plants significantly improved thrust-to-weight ratios, permitting rapid acceleration and vertical performance.[36] By the time the Gulf War began,

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[33] Creech, oral history inteview, 220
[34] Creech, oral history inteview, 221
[35] Lambeth, *The Transformation of American Air Power*, 72.
[36] Lambeth, *The Transformation of American Air Power*. 72.

over 1,100 F-15s had been delivered to USAF squadrons – the same number of fighters making up the total US fighter force today.[37]

To complement the F-15, the USAF developed the multi-role F-16 that introduced "hands on stick and throttle" (HOTAS) and computerized flight controls. To fulfill the Close Air Support (CAS) role, the A-10 was developed which introduced direct fire support via armor piercing munitions. In 1984, the USAF announced a multi-role replacement for the F-111. Designated the F-15E Strike Eagle, the modified air-to-air version became the derivative of the F-15 and F-16 and fulfilled the much-needed night, adverse-weather air-interdiction role. Finally, in the midst of a growing Soviet radar-guided surface-to-air threat, "Skunk Works" developed the first stealth attack aircraft, the F-117.[38] Designated the "Nighthawk", the F-117 would be instrumental in degrading the Iraqi IADS on the first night of Desert Storm.

The strategic landscape during the two decades preceding the Gulf War shaped and sized the fighter force of 1991. High readiness levels were attributed primarily to an existential threat and the abundance of resources. The defense budget grew from approximately $400 billion annually in the years immediately following Vietnam, to around $600 billion by 1985.[39] Strategic directives and the pursuit of operational joint doctrine via ALB firmly planted the requirement for a refurbished fighter force. Focusing on a balanced, flexible and forward deployed force, the USAF significantly improved the air dominance fighter inventory. While the process took more than a decade to accomplish, further examination into the air dominance force of the Gulf War is required to understand its readiness and capability.

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[37] Gulf War Air Power Survey (Organization : U.S.) and United States, *Gulf War Air Power Survey*, ed. Eliot A. Cohen (Washington, D.C: Office of the Secretary of the Air Force, 1993). 106

[38] Lambeth, *The Transformation of American Air Power*, 73.

[39] "The Defense Budget's Double Whammy: Drawing Down While Hollowing Out from Within," *Center for Strategic and International Studies*, October 18, 2012.

By the Numbers – Operation Desert Shield

The dramatic difference between today's CAF and the CAF of 1991 was the amount of war fighting resources available to the US during Operation Desert Storm. With the military defense built up in response to the Warsaw Pact, the fall of the Soviet Union meant the US could double, and in some cases triple, the amount of forces planned for a Southwest Asia contingency operation like ODS.[40] Some would offer that the US fought a scaled-down version of the war they were trained to fight against the Soviets, and therefore were over-prepared and completely outclassed the Iraqi military. To be sure, the air campaign outperformed military planner's predictions on the time required to achieve air superiority and on the number of aircraft losses. On January 27, 1991, just ten days after the start of ODS, the CAF had completely suppressed or destroyed the Iraqi IADS and accounted for 17 Iraqi air-to-air losses.[41] Military planning estimates concluded that gaining air superiority would take months, however the CAF accomplished it in a little more than a week. Coalition airpower was overwhelming in both numbers and quality.

The size of the US fighter force leading up to the Persian Gulf War was significantly larger than the force today. As mentioned in Chapter 2, the USAF committed only 655 of its 2,798 total fighter force inventory – approximately 23 percent.[42] The composition of air superiority F-15s that participated in the Gulf War included four 24 PMAI squadrons and one 28 PMAI squadron – the 27 TFS and 71 TFS stationed at Langley AFB, Virginia, the 58 TFS stationed at Eglin AFB, Florida, the 525 TFS stationed at Bitburg Air Base, Germany, and the 32 TFS stationed at

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[40] Eliot A. Cohen and Thomas A. Keaney, *Gulf War Air Power Summary Report* (Washington D.C., 1993). 29

[41] Cohen and Keaney, *Gulf War Air Power Summary Report, 29*

[42] A Statistical Compendium and Chronology, *Gulf War Air Power Survey*. 15

Soesterberg AB, Netherlands.[43] In comparison to today's air dominance fleet, a total of 124 Air Superiority fighters were deployed to Desert Storm – representing approximately 65 percent of the current F-22 and F-15C active duty fighter force and approximately 81 percent of the current total F-15C force.

F-15C/D STRATEGIC DEPTH		
USAFE	UNITS	PMAI
BITBURG, AB	2	48
SPANGDAHLEM, AB	1	24
LAKENHEATH, AB	1	24
	4	96
ACC	UNITS	PMAI
EGLIN, AFB	2	48
HOLLOMAN, AFB	3	72
LANGLEY, AFB	1	24
	6	144
PACAF	UNITS	PMAI
ELEMNDORF, AFB	3	72
KADENA, AFB	2	24
	5	96
TOTAL	16	336

Figure 5. F-15C/D Strategic Depth

Source: Gulf War Air Power Survey

Figure 5, F-15 C/D Strategic Depth, highlights two significant variables during the Gulf War - force composition and strategic reserve. First, the FWE for all F-15 operational units constituted 24 PMAI with three squadrons per location in most cases. The only exceptions to this construct were two USAFE air bases, Lakenheath and Spangdahlem, and one PACAF base, Kadena. More importantly, the USAF active duty strategic reserve numbered 336 F-15s that spanned the globe. In other

[43] *Gulf War Air Power Survey*, 27-30.

words, approximately 72 percent of the active duty force that was not engaged in ODS. Moreover, a little less than half of the European-stationed air superiority fighters remained at their stations.[44] While the ARC made up roughly 20 percent of the total USAF personnel in the Gulf, not a single F-15C ARC unit participated directly in the operation.[45] All told, the US committed just over a quarter of its total force capability to the Gulf War. While ODS represented the largest military operation since the Vietnam War, the substantially small portion of fighter assets committed to theater demonstrates the abundance of forces.

Air Dominance Availability

With such a large CAF, the supply of air superiority forces far exceeded operational demands. The availability of a surplus of resources permitted the conduct of mission related home-station training programs. Aircrews did not arrive to the Arabian Peninsula during ODS to train for a war; they came prepared to fight a war.[46] The only deployment demands on the fighter force came through realistic CONUS training scenarios, like Red Flag, and recurring exercise deployments to the Southwest Asia region.[47] In addition, the larger FWEs, primarily comprised of three 24 PMAI squadron, were more cost effective. Shortly after ODS, the Government Accounting Office (GAO) conducted an analysis of USAF fighter units and found that 24 PMAI squadrons were more economical. For example, in the mid-1990s annual operating costs for 72 F-15Cs were about $12 million less than 18 PMAI squadrons today.[48]

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[44] Cohen and Keaney, *Gulf War Air Power Summary Report*. 205

[45] Cohen and Keaney, *Gulf War Air Power Summary Report,* 217.

[46] Gulf War Air Power Survey (Organization : U.S.) and United States, *Gulf War Air Power Survey*, ed. Eliot A. Cohen, vol. Vol IV (Washington, D.C: Office of the Secretary of the Air Force, 1993). 358

[47] Cohen and Keaney, *Gulf War Air Power Survey, Vol IV*. 358

[48] United States General Accounting Office, *Consolidating Fighter Squadrons Could Reduce Costs*, May 1996. 5

The composition of the fighter force alone created an economy of scale conducive to high sortie production rates. Larger squadrons allowed maintenance specialty shops to be used more efficiently, requiring little or no change in maintenance staffing than that of smaller squadrons.[49] The abundance of aircraft on the ramp permitted unprecedented sortie production levels in contrast to those of today. Furthermore, FWEs with three squadrons flying the same aircraft could house a significantly greater number of parts and maintenance equipment.

According to the *History of the 36th Tactical Fighter Wing,* dated 1 April – 30 June 1980, F-15 force readiness measures met or exceeded operational requirements.[50] Over the three-month period in 1980, the wing flew 4,003 sorties for more than 4,800 hours of flying time – approximately 450 sorties per squadron per month.[51] Furthermore, the 36 TFW enjoyed surge capacity to meet operational demands in times of war. In June 1980, a 4-day unit readiness exercise (UREX) tested the wing's ability to respond to wartime tasking and maximize the training opportunities per sortie generated.[52] During the exercise, maintenance generated 580 sorties in just four days and approximately 70 percent of the sorties flown were dissimilar air combat tactics (DACT) – the primary mission set of the F-15.[53] In fact, the 36 TFW completed 100 percent of its training sorties in support of its biannual primary designated operational capability (DOC) requirement in just three months.[54]

According to the *History of the 33 Tactical Fighter Wing,* dated 1 October – 31 December 1982, the F-15 wing exceeded the TAC standard

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[49] United States General Accounting Office, 5.
[50] Air Force Historical Research Agency, "History of the 36th Tactical Fighter Wing," June 1, 1980, 26.
[51] Air Force Historical Research Agency, "History of the 36th Tactical Fighter Wing, 109.
[52] Air Force Historical Research Agency, "History of the 36th Tactical Fighter Wing, 27.
[53] Air Force Historical Research Agency, "History of the 36th Tactical Fighter Wing, 27.
[54] Air Force Historical Research Agency, "History of the 36th Tactical Fighter Wing, 31.

for maintenance effectiveness rates during the first quarter. The 58 TFS, flew 1402 sorties for an average 19.5 UTE, resulting in a fully mission capable rate averaging 72.6 percent – nearly 3 percent above the TAC standard.[55] This contributed to the accomplishment of more than 700 DACT sorties flown at home station and at Red Flag. Dissimilar adversaries included F-4s, F-106s, A-10s, F-5s and A-7s – all of which provided outnumbered training scenarios in fulfillment of DOC statements and eliminated the requirement to self-generate adversaries.

Fighter Pilot Availability

One of the variables impacting readiness is pilot morale and retention. Provided the opportunity to fly advanced training missions, there was no shortage of proficient, combat ready aviators. Across the CAF in the 1980's, nearly every air superiority wing met or exceeded manning requirements. In 1980, 36th TFW was authorized 356 officers and had 372 assigned – accounting for a 104 percent manning level.[56] The 33 TFW experienced similar manning levels. In 1982, the wing was authorized 103 pilots, however, during the 1st quarter of 1982, the wing had 115 pilots assigned.[57] While over-manning can have negative impacts on readiness levels today, the abundance of pilots and the capacity to train them prior to ODS made for a formidable fighter force. Moreover, manning levels fulfilled the strategic directive that called for avoiding excessive demands on personnel.

Manning levels in the CAF at this time were important for several reasons. As mentioned in the previous chapter, sufficiently manning squadrons to authorized levels provide flexibility and sustainability during training and real world operations. Although dwell times were not a factor in the years preceding the Gulf War, the strain on the force did

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[55] Air Force Historical Research Agency, "History of the 33 Tactical Fighter Wing," March 15, 1983. 76.
[56] Air Force Historical Research Agency, "History of the 36th Tactical Fighter Wing." 105.
[57] Air Force Historical Research Agency, "History of the 33 Tactical Fighter Wing." 86.

not exist when units were asked to deploy. All assigned operations and maintenance personnel were sufficient in numbers during deployments limiting the impact on home station manning and training levels. In other words, the proportion of attached pilots did not hinder deployed operations. Squadrons could sustain operations for a longer period of time and have less strain on the people accomplishing the mission. Additionally, matching or exceeding authorized manning levels provided flexibility and an enhanced quality of life. Pilots were able to take leave, attend training TDYs and participate in mission-related conferences. Ultimately, it was the enhanced individual tactical capability that significantly impacted operational readiness.

Realistic Combat Training

One of the most profound USAF realizations stemming from the Vietnam War involved realistic aircrew training. While the USAF focused on acquiring a technologically superior fighter force, the CAF focused on the human aspect of training. At a 1972 Nellis Air Force Base fighter symposium, TAC leadership acknowledged the "we may have concentrated too extensively on improving the machine and have not spent enough on the man who must fly it or on the training which he must have to make the machine an exploitable advantage."[58] In 1975, Colonel Moody Suter, with support of TAC Commander, General Dixon, inaugurated exercise Red Flag. During its initial years, a Red Flag exercise was conducted once a month.[59] A typical operation conducted in the late 1970s featured more than 140 aircraft of 19 different types, flying more than 2,000 training sorties altogether.[60] Aircrews throughout TAC were attending Red Flag on an annual basis, establishing the standard for other Large Force Exercises (LFEs).

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[58] Shimko, *The Iraq Wars and America's Military Revolution,* 289.
[59] Lambeth, *The Transformation of American Air Power*. 62
[60] Lambeth, *The Transformation of American Air Power*. 62

General Dixon's successor, General W.L. Creech, expanded the number and type of LFE scenarios for tactical aircrews. Green Flag, originally held at Nellis AFB, was designed to test aircrews in electronic warfare and suppression of enemy air defenses (SEAD). A biennial exercise held in Cold Lake, Canada, designated Maple Flag, brought together coalition forces and sister services for a week of intensive ground attack and air-to-air training.[61] Finally, beginning in 1985, Copper Flag at Tyndall AFB, Florida, conducted and air defense exercise for fighter aircrews and weapons controllers that featured realistic counter-air scenarios not available during home station training.[62] As fighter pilots refined their skills in combat training scenarios, the CAF began to develop specialized training requirements that would establish clearly defined roles and responsibilities.

Another finding in the 1972 Nellis AFB fighter symposium was that aircrew training should be optimized by reducing the number of roles required by multi-mission aircraft.[63] This new approach, called the Designed Operational Capability (DOC) system, assigned each fighter squadron a primary and secondary mission. Under the construct of DOC statements, individual units could now optimize the quality of training in lieu of the quantity of training. Sorties and mission events rather than flying hours now constituted the main measures of merit within the CAF's training program.[64] Now F-15 units, charged with the air superiority role, could maximize proficiency in their primary mission task resulting in a much more capable force.

Conclusion

The improvements in fighter platforms and the development of realistic training, backed with funding for sufficient flying hours,

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[61] Lambeth, *The Transformation of American Air Power*, 63.
[62] Lambeth, *The Transformation of American Air Power*, 63.
[63] Lambeth, *The Transformation of American Air Power*, 65.
[64] Lambeth, *The Transformation of American Air Power*, 65.

dramatically enhanced CAF readiness. By the mid-1980s, pilot proficiency levels had risen to an all-time high. Pilots were flying more than 230 hours annually, up from more than twice the prevailing average of around 150 hours during the mid-1970s – and more than twice the average in the Soviet Air Force.[65] Not only were pilots flying in sufficient quantity, but also the quality of training drastically improved. The frequency of realistic training sorties flown in exercises like Red Flag and intensive training home station training programs produced a new generation of American fighter pilots whose skills were described as "second to none."[66]

[65] Lambeth, *The Transformation of American Air Power*, 71.
[66] Lambeth, *The Transformation of American Air Power*, 71.

Chapter 4

A Force Too Small

"Not ready", or some other construction with the same meaning, seems to be the conclusion that can be used for every fallen air force – not ready because of quantity or quality of aircraft, aircrews, or both; or because the deficient doctrine for the campaign at hand; or because the air force had (or chose) to operate without taking care of materiel infrastructure. These suggest that the fall of an air force is the result of long-term failings, not at immediate failure "on the day" by an air arm that is essentially ready for its allotted role.

Robin Higham and Stephen J. Harris
Why Air Forces Fail, The Anatomy of Defeat

There is a dramatic difference in how the USAF bought, built and trained the CAF of 1991 compared to that of today. While senior USAF leaders make difficult decisions on further force reductions, the future of combat airpower capability remains unclear. Today, the F-35 is the only new American fighter in production, but funding constraints threaten the total number the USAF will be able to purchase. Progress toward creating a the "right sized" fighter force is threatened by a $1 trillion cut in defense spending along with a growth in military pay and benefits that absorb funds needed for research and development (R&D) and procurement.[1] Bureaucratic politics threaten to maintain established budget shares for the USAF instead of funding capabilities relative to its contribution to national security.[2] To make matters worse, in response to the FY 15 DoD budget request, the USAF plans to eliminate nearly 500 more aircraft from its inventory in the next five years – including 51 F-15s and the divestment of the entire A-10 fleet.[3] With the smallest

[1] Mark A. Gunzinger and David A. Deptula, "Toward a Balanced Combat Air Force" (Center for Strategic and Budgetary Assessments, March 2014), 2.
[2] Mark A. Gunzinger and David A. Deptula, 2.
[3] Brian Everstine, "Air Force Details Fleet Cuts," *Air Force Times*, no. March 2014

fighter force in history, how capable is the CAF in fighting across the Range of Military Operations?

The purpose of this chapter is to identify the operational and strategic impacts of the size and readiness of the current CAF. Specifically, it will measure fighter force resources and provide a realistic assessment of the CAF's value in light of standing airpower expectations. Applying four key variables – the size of the fighter force, air superiority availability, fighter pilot availability, and realistic combat training levels – it will answer the research questions posed at the beginning of this paper. If the air fighter force was called to fight a major combat operation against a force similar in capabilities to the Iraq Air Defense System of 1991, could we do it and at what cost? If so, what percentage of total fighter force resources, including aircraft and pilots, would the CAF need to commit to war and how do current readiness levels impact the quality of that force? More importantly, what strategic risks would the US face from an insufficiently sized fighter force committed to a major combat operation?

Assumptions

Before examining CAF resources, it is important to lay down four fundamental assumptions that underpin the purpose of combat airpower and the crux of this argument. First, airpower is America's asymmetric advantage.[4] The level of technological superiority inherent in US combat airpower provides a global presence with precision lethality unmatched by any nation. It will remain America's quick reaction force and its primary military bargaining tool. Combat airpower makes the US unique in terms of military capability. Second, in accordance with the new US Defense Strategy termed Strategic Agility, the US seeks to avoid involvement in protracted ground wars and emphasizes the importance of technologically superior assets that can quickly and decisively

[4] Grant, Rebecca, *Losing Air Dominance*, A Mitchell Institute Special Report (Mitchell Institute Press, September 2008). 6

eliminate threats to the US and its allies. This places an emphasis on the need for a combat air force that can produce desired effects in relatively little time at low risk. Third, USAF strategic guidance directs that while the Air Force will no longer be sized to conduct large-scale, prolonged operations, it must be capable of deterring aggression and providing a stabilizing presence in high priority areas like the Asia-Pacific and Middle East, while maintaining defense commitments to Europe and other allies.[5] This requires a combat air force that is right-sized and ready to combat threats on a global scale, across the full spectrum of operations. Finally, numbers matter. Mass and concentration remain fundamental principles of war and no force commits to battle without considering enemy strength. Great powers have big air forces to fight big wars and the most formidable force maintains a delicate balance between force structure and a modernized, technologically superior force.

Risk

As the USAF seeks to become a smaller more capable force, what risks does it face? For the purposes of this argument, risk is the calculated probability that the cost associated with taking an action, or not taking an action, will outweigh the benefits. Risk is the ultimate determinate in making the decision to use or not to use force. Cost relates to the proportion of total assets required to accomplish a task and the consequences that occur from placing them in harm's way. In combat, there is an opportunity cost associated with implementing and executing war. This means in order to fight a major theater war, the US will have to sacrifice the opportunity of using the force in other ways. In this context, cost has strategic implications like losing national power and prestige as a result of a failed air campaign, losing credible deterrence, and the ability to sustain defense commitments, or squandering the use of force by fighting a ruinous war. While the US

[5] "Strategic Agility: Strong National Defense for Today's Global and Fiscal Realities" (Stimson, September 2013). 3

defense establishment acknowledges elevated levels of risk, the inability to articulate the costs associated with the size and readiness of the CAF is problematic. So what do the numbers tell us?

TOTAL FIGHTER FORCE STRENGTH		
GULF WAR	TODAY	2016
2,798	1,100	847*

Numbers represent total PMAI – those aircraft maintenance can produce to conduct combat operations. *Designates the number of fighters after the FY 15 budget request that eliminates 51 F-15Cs and 202 A-10s from the current CAF PMAI.

Figure 6. Total Fighter Force Strength

Source: Author's Work

Total fighter force strength is important in determining strategic risk and the ability to sustain combat operations. According to the Gulf War Air Power Survey (GWAPS), two key factors made ODS such a success. Fighter forces prepositioned in the theatre and the number of bases available in the Gulf states provided a marked advantage for military planners, and the amount of preparation time between the August invasion and the start of ODS in January 1991. During the Gulf War, the USAF deployed 655 fighter aircraft to theater. Accounting for approximately 23 percent of the total force, the USAF retained 2,143 fighter aircraft in strategic reserve. As a result, a significant proportion of US fighter force presence remained in the European and Pacific regions. Within the air superiority force alone, four F-15 squadrons remained in the European theater. Totaling 96 aircraft, the USAF retained approximately 77 percent of the total air superiority force in close proximity to the force that was deployed to the Persian Gulf. Not only did the US and its allies have air superiority presence to cover its bets across the European continent, but the remaining force was geographically positioned to provide an operational reserve that could increase the sustainability of combat operations.

Today the CAF lacks strategic positioning and depth. According to CSAF General Mark A. Welsh, the US has 75 percent less force presence in Europe today than it did in 1991.[6] If the US were to fight a major air campaign like ODS, and it required a force similar in size, the USAF would commit approximately 60 percent of its fighter force. If FY 15 budget measures are implemented and the USAF eliminates a portion of the F-15C fleet and the entire A-10 fleet, the USAF would commit approximately 77 percent of its total fighter force to war. While this measure does not include the undetermined acquisition of F-35s, it does suggest that if we continue to cut force structure, the USAF will be required to commit three-quarters of the fighter force to a major theater operation as early as 2016. For example, if the US were to engage in a large-scale air campaign in the CENTCOM AOR, approximately 23 percent of the force would be left to cover the Asia-Pacific region. If combat operations exceeded the estimated timeline, the remaining force could be required to fill forward, leaving the US vulnerable to its priority commitments or forcing decision makers to reevaluate the use of force. With the small percentage of the fighter force remaining, the USAF cannot dissuade aggression, provide a stabilizing presence in high priority locations, or maintain its defense commitments to other nations. The fighter force numbers reveal several strategic vulnerabilities, but how does the size of the air superiority fleet impact the ability to conduct large-scale operations?

[6] Welsh, General Mark A., *Military Strategy Forum* (Center for Strategic & International Studies, 2014), http://csis.org/event/military-strategy-forum-general-mark-a-welsh-III.

AIR SUPERIORITY FIGHTERS AVAILABLE (F-22/F-15C)			
PERIOD	GULF WAR	TODAY	2016
WARTIME REQUIREMENT	124	124*	124*
STRATEGIC RESERVE	378	152	101
PERCENT OF TOTAL FORCE	33%	45%	55%
F-15C TOTAL	450 AC / 52 ARC (502)	66 AC / 87 ARC (153)	48 AC / 54 ARC (102)
F-22 TOTAL	N/A	123 (TFI)	123 (TFI)

AC = Active Duty Component / ARC = Air Reserve Component. *Designates the number of Air Superiority fighters required for a large-scale air campaign. This number is not based on currently planning assumptions that would impact the number of fighter required today and thus only serves as a numerical comparison to ODS.

Figure 7. Air Superiority Fighters Available

Source: The Military Balance 1989-1990

Figure 7 reveals some interesting numbers regarding the availability and composition of air superiority fighters for a major combat operation. First, assume that planning considerations dictate that the joint force commander (JFC) requires 124 USAF air superiority fighters in theater to successfully gain and maintain control of the air at an acceptable level of risk, within the desired timeframe. During the Gulf War, this number represented 33 percent of the total force, compared to 45 percent today, and 55 percent with the proposed future cuts. While the USAF committed only 23 percent of the total fighter force in 1991, it required a significantly higher percentage of its air superiority force. Accordingly, a smaller force requires an even larger proportion of air superiority fighters if the wartime commitment remains the same. Deploying approximately half of the force as opposed to a third of the force bears strategic significance, however, the consequences of doing so today carry much greater weight.

The composition of the air superiority force unveils three additional concerns. First, the balance of AD versus ARC air superiority assets is dramatically different than historical levels. In 1991, the AD F-15 fleet outnumbered the ARC by a ratio greater than 8 to 1. Accordingly, the

USAF committed 124 F-15s to the Persian Gulf, retaining 66 percent of the AD force and 100 percent of the 52 ARC F-15s. However, CAF reductions have driven the size of the F-15 AD force to the point where the ARC now outnumbers it by 1.3 to 1. Possessing the majority of the force, the ARC component will be required to make a significantly greater commitment in fulfilling wartime operations. Again, if the US were to conduct a large-scale air campaign in the CENTCOM AOR and it was politically untenable to deploy 48 AD F-15s out of the PACOM AOR, the only remaining AD squadron able to fulfill the requirement would be the 493 FS at Lakenheath. Comprised of an 18 PMAI, the preponderance of force structure would be provided by the ARC. Moreover, FY 15 force reductions that eliminate the remaining air superiority presence in Europe will require the ARC to support 100 percent of the F-15C wartime requirement. The strategic reserve will become the CAF's front line fighting force during the initial stages of combat.

Although the AD and ARC accomplish similar training requirements, the US does not traditionally rely on its Air Reserve force to contribute to the initial phases of major combat operations. This places a much greater commitment on ANG units who primarily uphold the homeland defense mission. As a result, the US would accept risk in conducting air sovereignty alert (ASA) operations. Moreover, the future cuts to the F-15 force will drive ANG squadrons even smaller – from 18 PMAI to 15 PMAI – reducing the number of sorties it can contribute to war. Although current assessments are underway in redefining the roles and responsibilities of the ARC, placing most if not all of the demand for F-15C wartime capability on the reserve force is a glaring indicator of a force too small.

The second concern of force composition relates to the generational capability gap between air superiority fighters. The pursuit of an all-stealth force was in direct response to the proliferation and growing capability of threat Integrated Air Defense Systems (IADS). Legacy F-15s

operating in Anti-Access/Area Denial (A2/AD) environment have an extremely low probability of survival. If the US wanted to minimize risk to the force, it would rely entirely on F-22 employment during the initial stages of a large-scale conflict. However, it is politically unacceptable, and in fact impossible, to commit the entire F-22 fleet and still fulfill the air superiority wartime requirement. Under current F-22 force structures, only 123 aircraft exist to support COCOM demands – one aircraft short of the 124 required for war. But how did the US fail to procure enough F-22s to meet the wartime requirement for a MCO?

The defense guidance of the 1990s reflected the tremendous advance in capability with the development of the F-22. The 1997 QDR justified reducing the planned F-22 purchase by 50 percent, asserting that the new stealth fighter had "much greater capability over that of the F-15." The once sought after "all stealth" force only comprises 44 percent of the air superiority force, and less than 17 percent of the total fighter force. Therefore, if we accept that the F-22 is twice as capable as the F-15, then the JFC would require 50 percent less forces in theatre – according to the figures in Figure 7, approximately 62 F-22s. Unfortunately, this logic is flawed for several reasons.

The F-22 employs the same type and number of air-to-air weapons as the F-15C. While it possesses improved performance and survivability in a contested, degraded environment, it does not possess the ability to employ more firepower. This becomes problematic for several reasons. First, air-to-air missiles do not destroy the target 100 percent of the time. There is an associated probability of weapons effect (P^{WE}) that is determined by a number of factors impacting missile success. These include missile kinematics, saturation of the electromagnetic spectrum (EMS), aircraft radar cueing and target aircraft maneuvering. Moreover, F-22s will likely employ in a mixed air-to-ground and air-to-air configuration during the initial phases of a large-scale operation that requires defeating an enemy IADS. Executing in this multi-role

configuration, the F-22 is significantly limited in the number of air targets it can engage, and the duration that it can remain on station supporting the air-to-air engagement. General Mark A. Welsh III, CSAF, underscored the significance of the problem by stating "we don't have enough F-22s to fight a major theater conflict, so we must support them with something else."[7] The F-15C fulfills this supporting role, but in doing so remains vulnerable to the surface threat. Thus, if the wartime requirement dictates that F-15s support the initial stages of the air war, the force may endure substantial losses. Ultimately, the wartime requirement, the size of the air superiority force and its composition elevate the operational level of risk, particularly if the US faces a formidable air threat requiring more than 124 air-to-air fighters.

Fighter force structures may require placing multi-role platforms in non-traditional air-to-air roles. To compensate for insufficient numbers of F-22s and F-15s, the F-15E and F-16 may become an integral part of controlling the air. Primary mission roles for these platforms include air interdiction, suppression and destruction of enemy air defenses (SEAD/DEAD) and close air support (CAS). Air-to-air employment is a secondary mission requirement, and aircrews may not be as proficient in executing this role. Moreover, the drastic reduction in training resources means that F-15E and F-16 squadrons are struggling to maintain proficiency in their primary mission areas, much less air-to-air. With less than 23 percent of fighter squadrons meeting the minimum RAP requirements to fulfill primary C-NAF missions, the USAF risks greater losses in a large-scale operation while reducing the level of effort from the CAF's air-to-ground fighter force.[8] Fewer strike platforms will be available to destroy ground targets critical to gaining and maintaining air superiority. With a realistic assessment of the impact of fighter force

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[7] Welsh, General Mark A., *Military Strategy Forum* (Center for Strategic & International Studies, 2014), http://csis.org/event/military-strategy-forum-general-mark-a-welsh-III.
[8] "2012 ACC History Readiness Extract."

structure, it is important to examine how fighter pilot availability will affect the CAF's ability to execute across the full spectrum of operations.

PILOT AVAILABILITY	
GULF WAR	TODAY
≥ 100% MANNED	*60-90% MANNED

Based on research from F-15 squadrons in the 1980s and F-15C/F-22 squadrons today. * Designates shortage of 200 fighter pilots, projected to be 700 by 2020.

Figure 8. Pilot Availability

Source: Author's Work

Figure 8 reveals a dramatic difference in manning levels from the Gulf War period to today. The research presented in Chapter 3 demonstrates the abundance of manning within the CAF of 1991. Of the three F-15 fighter wings examined, all met or exceeded required manning levels. However, the air superiority community today is struggling to produce enough pilots and maintain required experience levels. While the size of the force determines the capacity to produce pilots, the inability to maintain sufficient manning levels is impacted by the excessive demand placed on airpower. Currently, the fighter force is approximately 200 pilots short and projected to be 700 pilots short by 2020.[9] Several consequences from CAF reductions are causing insufficient manning levels. In the F-15 community, base closures over the past decade have left the remaining active duty fleet in just two overseas locations – Lakenheath AB, England and Kadena AFB, Japan. While Major General Lyon stated that while they are right where the air components need them to support theater objectives, the pilots have nowhere to come home at the end of their Date of Return from Overseas

[9] "The Air Force Is Facing a Pilot Shortage Crisis." 6

(DEROS) and that is unsustainable.[10] Unless active duty F-15 pilots join the ANG, they risk never being stationed in the United States. This is problematic, particularly when the best fighter pilots are typically selected to move between operational units. The lack of operational flexibility is contributing to the problem of pilot retention.

The imbalance between force structure and COCOM demands are also driving pilots out of the Air Force. The unconstrained CCDR demands exceed available capabilities. In the National Commission on the Structure of the Air Force report dated 20 January 2014, Pentagon force managers testified about the difficulty in meeting Combatant Commander (CCDR) "demand" for air power within the given supply. Under the current force structure, the AF is struggling to meet the 1:2 deploy-to-dwell requirement.[11] In 2012, General Hostage, Commander of ACC, stated "that in an environment of unlimited funding, there would be no reason to leave a COCOM request unfulfilled. However, annual reductions in defense budgets combined with the threat of sequestration's across-the-board cuts complicated ACC's attempts to organize, train and equip enough capacity within the CAF to support national military strategy as executed by the COCOMs."[12] The force is too small to do what COCOMs are asking it to do.

Some USAF officials reason that if you possess the most technologically advanced fighter platforms in the world, then the incentive for pilots to stay is greater. However, the research presented here demonstrates that if you do not have the most technologically advanced platforms in sufficient number, the type of MDS you fly makes no difference. Furthermore, if you do not effectively train with technologically advanced systems, operating in a contested environment

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[10] Lyon, Maj Gen Charles W, "Corona South 2012." 34

[11] *National Commission on the Structure of the Air Force*, Report to the President and Congress of the United States, January 30, 2014. 17.

[12] "2012 ACC History Readiness Extract." 34.

becomes dangerous to non-proficient operators. According to Air Force Doctrine Document (AFDD)-1, the perception of credible US forces underpins many deterrence and assurance strategies that led to greater regional stability and security. If USAF requires a capable and credible CAF, then it stands to reason that the most proficient, sufficiently manned force can only strengthen the CAF's dissuasive value. Perhaps the greatest intangible attribute brought to the Gulf War by the CAF was the supreme confidence in the ability of their pilots and the quality of their equipment.[13] Leading up to the Gulf War, the USAF had spent the previous two decades training for a far sterner Soviet threat than the one they faced and few doubted that the war would end other than with a crushing Coalition victory.[14] What do today's training levels imply about the fighter force?

REALISTIC COMBAT TRAINING LEVELS	
GULF WAR	TODAY
RED FLAG - 20 MONTHS / 10 SORTIES	RED FLAG - 40 MONTHS / 5 SORTIES
100% RAP	23% RAP

Represents the frequency of squadron participation in Red Flag and quantity of pilot sorties per exercise. RAP percentages reflect fighter squadrons that achieve minimum training standards to be declared ready to perform primary C-NAF missions.

Figure 9. Realistic Combat Training Levels

Source: Author's Work

While the first three variables relate to a quantitative analysis of resources, the level of realistic combat training is associated with a qualitative characteristic of the force we have, or in this case readiness. Fifty percent decreases in the number and frequency of high-fidelity training exercises per squadron, and number of sorties per pilot, have

[13] Eliot A. Cohen and Thomas A. Keaney, *Gulf War Air Power Summary Report* (Washington D.C., 1993), 221.
[14] Cohen and Keaney, *Gulf War Air Power Summary Report* , 221.

had a tremendous impact on the ability of the fighter force to meet primary mission requirements. More alarming is the percentage of fighter squadrons failing to meet RAP minimums. Figure 9 highlights an alarming trend – not only is the USAF too small, but it is not ready.

Quality training opportunities do not exist in sufficient numbers. The ACC End of Year Readiness Review concluded that the FY 14 Flying Hour Program (FHP) will only allow CAF units to fly at the CMR level for approximately 70 percent of the annual training cycle while flying at a reduced level for the remaining 30 percent of the training period.[15] The lack of quality training in air superiority units resulted in flying 140 percent of the minimum required "basic skills" sorties, but only 76 percent of the minimum "primary" mission sorties.[16] In addition to flying hour short falls, the force is not conducting weapons training. In 2011, the 493 FS attended the Weapons System Evaluation Program (WSEP) where the squadron had an unprecedented 26 first-time missile shooters.[17] Nearly the entire squadron had never employed a live missile. As a result, the lack of experience and low readiness levels limits the USAF's asymmetric airpower advantage, its ability to react to time critical security threats, its ability to employ at low risk, or fulfill its defense commitments. More importantly, committing 60-70 percent of the fighter force assumes a properly resourced and ready CAF. Today's force, failing to meet readiness minimums, would require a significantly larger portion of the force to compensate for increased wartime attrition levels.

Realistic Assessment

Under the current state of affairs, the CAF can successfully conduct a major theater operation. However, the evidence presented here indicates there is an insufficient quantity and quality of resources to

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[15] Thomas Boyd and Greg Calhoun, *Air Combat Command End of Year Readiness Review*, Summary (ACC/A3T, December 5, 2013).

[16] ACC, *Air Combat Command End of Year Readiness Review* 2013.

[17] Renegar, *Interview*.

execute a large-scale air campaign without accepting significantly greater strategic risk. If the goal is to achieve national objectives and conclude hostilities on conditions favorable to the United States and its multinational partners, as quickly with as few casualties as possible, and in a manner that conveys continuing strategic advantage for the United States and its partners, then the US has a difficult decision to make. Either commit 70-80 percent of a marginally prepared CAF and attempt quick, decisive victory while weakening its ability to deter aggression, stabilize and maintain defense commitments to Europe and other allies, or restrain the use of force by committing a smaller percentage of the CAF and risk failing to accomplish the mission. Either way, the strategic objectives require a much larger force posture with more advantageous geographic positioning. If airpower is America's asymmetric advantage, then the CAF is not sized to bear the weight of US national strategic interests. Simply put, if combat airpower cannot force the enemy to capitulate in a matter of weeks, then the CAF is not right-sized or trained to fight a large-scale operation at an affordable rate.

The CAF is suffering from an imbalance between recapitalization and force structure. Force numbers are too low to support operational readiness levels, much less fulfill the national strategic intent. In support of the Strategic Agility concept, the small CAF certainly retains flexibility and agility, however it simply lacks the number of fighter assets and people to fulfill a strategic role. As a result, the US is losing the ability to leverage an "air only" option and will have to rely on mobilizing the full military instrument of power for conflicts on the lower end of the war fighting scale; those typically delegated to and accomplished by a single service, or very small portions of the joint force. Seeking to avoid protracted ground wars, the increased cost of employing the force may require the US Army, Navy or Marine Corps to fill the gap left by a CAF too small. What if the CAF was called to fight a big war?

If the US employs the CAF to fight a major theater operation, senior political and military officials must adjust expectations. While most acknowledge the increased levels of risk to the force, articulating the operational and strategic impacts are critical in determining when and how to exploit the use of force. First, winning in decisive fashion may be the exception and not the rule. Current resource constraints means that "combatant commanders have less capability, less sustainability, less flexibility that will impact our ability to do things as a nation."[18] Fighting a big war today means greater CAF attrition and a decreased probability that operations will achieve objectives in sufficient time.

Second, committing 70-80 percent of the CAF to war will change the risk calculus for using the force. Such a large percentage of the force increases risk and cost, which in turn lowers the probability that the force will be used except when the stakes are extremely high. This could have several impacts on political decision makers. A force too small could put the brakes on the reckless use of force, however an overly cautious use of force could play to an adversary's advantage. A right-sized and ready CAF exemplifies US power and prestige, but more importantly serves as a commodity to be traded at the political bargaining table. The quantity and quality of US military capability has historically provided overwhelming security and led other countries to side with American interests and not another competitor. However, the CAF numbers and the strategic vulnerabilities presented in this chapter indicate the US is losing value in its capability to reassure the international community. As a result, the US may be faced with a situation in which it needs to use the fighter force to achieve political objectives, but it will choose not to simply because the cost of doing so is too high. How then does the size of the CAF and its use impact its deterrent value?

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[18] Welsh, General Mark A., *Military Strategy Forum.*

If an essential role of the CAF is to dissuade the opposition from conducting war, then the lack of strategic depth is decreasing its value. As a result, states may be encouraged to accept risk that they would not ordinarily assume leading to instability and elevating the probability of conflict. Although the US responded with CAF assets to the crisis precipitated by North Korean nuclear tests, the recent Russian invasion of Crimea provides an example of the impact of a waning US fighter force value. Previous US fighter force presence within the region may have dissuaded Russian President Putin from leveraging military forces to gain control of the Ukrainian peninsula. Although the US ultimately committed Lakenheath F-15s to the region, the move had little impact on Russia's resolve to occupy the Crimea. As Russia gains strength within the region, the US faces greater likelihood that nations could disassociate with American power and leave its side if it cannot maintain its defense commitments. What is the purpose of the CAF?

There is a consensus on the purpose of the USAF – to project combat airpower. The USAF needs the CAF to create uncertainty in the minds of the potential adversary. The air dominance fighter force is designed to knock down the door and command the battle space. According to former CSAF General Jumper, "to come and get you anywhere when there's nothing you can do about it is unbelievable leveraging."[19] His successor, former CSAF General T. Michael Moseley, shares the same sentiment and contends that the uncertainties of the world require a broader focus and CAF must provide the POTUS with the ability to deter, dissuade and shape.[20] Without a sufficient, ready 5th generation force, it degrades POTUS ability to deter or dissuade or shape.[21] Cancelling programs and significantly reducing force structure limits yourself operationally and you become the one shaped, deterred or

[19] Smith, "Shaping an Air Force: From a Chief's Perspective", 45.
[20] Smith, "Shaping an Air Force: From a Chief's Perspective", 51.
[21] Smith, "Shaping an Air Force: From a Chief's Perspective", 58.

dissuaded.[22] Without a right-sized, ready force, the chance of a threat challenging US resolve, particularly its airpower, is greater now than if our force maintained and exhibited a high readiness posture. History tells us that we can never get it entirely right, therefore, we should strive not to get it so far wrong that we suffer unacceptable consequences when hit by unexpected threats.[23]

Conclusion

The numbers associated with the fighter force are dramatically different from the force of 1991. The total force structure, availability, and composition of air superiority assets, and the lack of realistic training opportunities will force the CAF to take non-traditional measures if engaged in a major combat operation. Committing the force to a major air campaign will make the US strategically vulnerable to maintaining its global dissuasive posture and stabilizing presence. The USAF will be required to commit a significant portion of the ARC – a force traditionally held in strategic reserve. The air superiority force composition will require multi-role platforms, traditionally executing air-to-ground roles, to fulfill primary air-to-air roles.

The size of the air superiority fighter force is insufficient to produce the desired airpower results in a contested and degraded environment if conditions require sustained combat operations. The CAF successfully conducts low intensity, limited conflicts, but the cost and risk associated with conducting major war should make political decision makers extremely cautious about using the force. Air superiority is a precursor to conducting a successful military campaign, and under the current state of affairs the US not only risks losing wars that matter, but failing to maintain its status under the redistribution of power.

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[22] Smith, "Shaping an Air Force: From a Chief's Perspective" 62.

[23] Richard J. Dunn, "The Impact of a Declining Defense Budget on Combat Readiness," *The Heritage Foundation*, July 18, 2013, http://report.heritage.org/bg2828.

Conclusion

A multipolar world has long been predicted, but has always seemed to be perched safely on the horizon. Now it has rushed quite suddenly to the present…The lazy way to describe the new geopolitical landscape is one of a contest between the west and the rest – between western liberal democracies and eastern market-economy autocracies. Neat as such divisions may seem, they miss the complexities. None are more determined, for example, than Russia and China to keep India from securing a permanent seat on the UN Security Council. Few are more worried than India by China's military build-up…The rising nations prize state power over international rule, sovereignty over multilateralism. The transition to a new order is likely to see more rivalry and competition than co-operation. The facts of interdependence cannot be wished away but they will certainly be tested. It is going to be a bumpy ride.

Philip Stephens, *On the Way to a New Global Balance*

My biggest concern for ACC in the future, and for the Air Force, is that the global power pillar is shrinking. It's shrinking because there is no current, real-time, tangible need for a strong global power pillar. There's an industrial base that is required to support global power. We need advocacy for global power, and that advocacy needs to come at the four-star level.

Maj Gen Charles W. Lyon

The diminishing size and readiness of the combat air force is threatening national security. No longer sized to conduct large-scale, prolonged operations, the USAF may be facing a strategic inflection point – incapable of fighting wars of significance without unacceptable strategic risk to the nation and its allies. Failing to re-equip itself for the first time since World War II, the size of US fighter force has reached

record lows.[1] Deliberate national strategic choices over the course of two decades, in conjunction with the recent incremental and reactionary changes in defense spending, have left the USAF with the smallest force in history.[2] While the CAF retains force structure levels to fight a large-scale air campaign, the inherent risks associated with the small force could leave the US vulnerable to emerging security threats.

Today, the CAF has no strategic reserve and the US is just one Desert Storm away from not being able to fulfill its security commitments. The total fighter force is 60 percent smaller today than it was in 1991, and forecast to be 70 percent smaller if the FY 15 budget recommendations transpire. While the USAF committed only 23 percent of the fighter force to the Gulf War, today the numbers are dramatically different. If the CAF was called to fight a force similar in capabilities to the Iraq Air Defense System of 1991, the US would commit approximately 60 percent of the fighter force today, and approximately 78 percent by 2016. Lacking strategic depth, the US would be required to mobilize forces from much greater distances than the force of 1991. Aside from the logistical challenges of deploying a geriatric force across the globe, less than a quarter of the CAF would remain to fulfill US security commitments. A large-scale conflict in one of the three high priority areas – the Asia Pacific, Middle East or in support of European allies - would leave the remaining two areas stripped of sufficient fighter forces. As a result, the US could be required to forego air policing in support of NATO agreements, or the ASA mission in support of homeland defense. The CAF lacks the capacity to be regionally engaged while globally committed.

The size and composition of the air superiority force is dramatically different today. The Gulf War required 124 F-15s to fulfill the Air

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[1] Rebecca Grant, "Combat Air Forces in Crisis," *Mitchell Institute for Airpower Studies*, Mitchell Paper 1, March 2009, 21

[2] Grant, *Combat Air Forces in Crisis,* 23.

Superiority mission – approximately 33 percent of the total F-15 force. Today, that number would require 45 percent of the F-22/F-15C force, and 55 percent if further F-15 reductions transpire. Moreover, the USAF only possesses 123 combat coded F-22s – one fewer than the Gulf War requirement. The preponderance of the F-15C now lies in the ARC. In 1991, the AD component outnumbered the ARC 8 to 1 and relied entirely on the AD fleet during ODS. Today, the F-15C ARC fleet outnumbers the AD fleet 1.3 to 1, meaning that forces traditionally held in strategic reserve will be required to conduct the initial phases of war. Moreover, the F-15C, which currently makes up 55 percent of the air superiority force, is extremely vulnerable in an A2/D2 environment. This may require non-traditional fighter assets to assume primary air superiority roles, increasing blue force attrition and decreasing the level of effort dedicated to the air-to-ground mission. As a result, air superiority will take longer to achieve and come with greater losses.

Finally, manning and readiness exacerbate the risks of a small CAF. Insufficiently sized, the CAF is failing to produce enough pilots and maintain required experience levels. Deploying a squadron often strips the remaining units of personnel at home station, bringing training operations to a standstill. The insatiable COCOM demand for airpower is precluding units from executing training programs and attending realistic training exercises, like Red Flag and WSEP. Unsustainable dwell ratios prevent fighter squadrons from meeting minimum RAP requirements, while high operational tempos are to blame for a growing pilot retention crisis.

The CAF is not sized or ready to bear the weight of US national strategic interests. If the national command authority called upon the CAF to conduct a large-scale operation, the USAF would be required to commit a large percentage of a marginally trained force from across the globe, with little ability to sustain combat operations for any extended period of time. The lack of forward permanent presence and

prepositioned equipment will limit CAF responsiveness as well as reduce flexibility in the political decision-making process. The high demand on the CAF would pull assets from strategically relevant regions. The risk in committing such a large proportion of the CAF may require mobilizing the other military service organizations to fill the force requirement gap. The combined risks and costs associated with a major theater operation could exceed the political benefits of using the CAF and sideline the force when national security interests necessitate its use.

To manage risk in a time of fiscal austerity, the defense establishment will be required to rebalance the supply and demand of combat airpower if it chooses to retain a viable CAF. Two strategies exist to meet this objective. The US can scale-back defense commitments to keep pace with the limited resources available to fund and operate the CAF. However, this may threaten our ability to build and sustain partnership capacities and strain relations between the US and its allies. Moreover, the lack of commitment may invite aggression from adversaries who detect weakness from declining US power. The alternative is to shift to an airpower-centric strategy that will secure a larger proportion of available resources. Accepting this strategy would match the Strategic Agility concept that seeks to avoid involvement in protracted ground wars and emphasizes the importance of technologically superior assets that can quickly and decisively eliminate threats to the US and its allies. This will require securing a larger portion of the defense budget, a measure that may be politically untenable and place the other services at greater risk, but critical to national security.

In the end, the US has a growing strategy-resource mismatch – a widening gap between what our leaders say and what the nation can accomplish.[3] As global political ambitions persist, the US must fund the CAF to reduce its hegemonic decline in a time of growing uncertainty.

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[3] David A. Deptula,, "America's No-Fly Zones Are Already in Place," *The Wall Street Journal*, June 23, 2013. 3

Moreover, while we have time to plan and think, we must develop the means to match the ends in the long term.[4] Failure to do the math beforehand has left air forces in the precarious position of having to fight the wrong battle at the wrong time, given their equipment, training and resources.[5] As we enter into a time of uncertainty, will the CAF have the capacity to sustain national security when the time for deliberation is over and action is at hand?

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[4] Robin D. S. Higham and Stephen John Harris, eds., *Why Air Forces Fail: The Anatomy of Defeat* (Lexington, KY: University Press of Kentucky, 2006). 10

[5] Robin D. S. Higham and Stephen John Harris, 10.

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